



# Livingston County All Hazards Mitigation Plan



Livingston County Hazard Mitigation  
Planning Committee

Review Draft May 2011







# Livingston County, Illinois All Hazards Mitigation Plan

Including:

Village of Campus  
Village of Chatsworth  
Village of Cornell  
Village of Cullom  
Village of Dwight  
Village of Emington  
City of Fairbury  
Village of Flanagan  
Village of Forrest  
Village of Long Point  
Village of Odell  
City of Pontiac  
Village of Saunemin  
Village of Strawn  
Reading Township  
Livingston County

Livingston County  
Hazard Mitigation Planning Committee

Review Draft  
May 2011



This *All Hazards Mitigation Plan* was prepared with the planning consultant and technical support services of Molly O'Toole & Associates, Ltd., 450 S. Stewart Avenue, Lombard, IL 60148-2851, [www.mollyotoole.com](http://www.mollyotoole.com). Technical support for the manmade hazards assessment was provided by Johnson Depp & Quisenberry, Inc., 6450 S. 6<sup>th</sup> Street, Suite B, Springfield, IL 62712, [www.jdq-engineers.com](http://www.jdq-engineers.com), and the mapping services by [CustomHazardMaps.com](http://CustomHazardMaps.com).

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# Livingston County All Hazards Mitigation Plan

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## Executive Summary

Livingston County is subject to natural and manmade hazards that have threatened life and health, and have caused extensive property damage. Severe storms and flooding impacted the County in 1974, 1982 and 2008. Severe winter storms in 1990, 1999 and 2001 led to disaster declarations. The June 2008 tornado caused extensive damage, caused serious injury and took one life. The County is vulnerable to a number of other hazards and to better understand their potential impact on people and property, this countywide *All Hazards Mitigation Plan* has been developed. This *Plan* also identifies ways to reduce the impacts of natural and manmade hazards throughout Livingston County. The Plan focuses on the six major natural hazards facing Livingston County:

- Tornadoes
- Floods
- Severe Summer Storms
- Severe Winter Storms
- Extreme Heat
- Extreme Cold

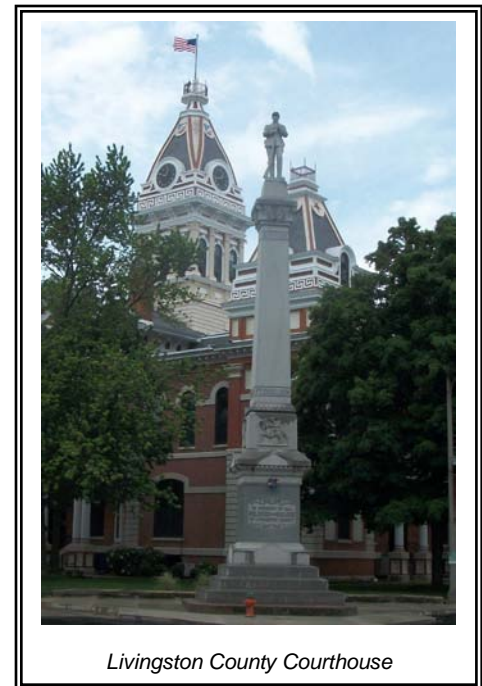
And four manmade hazards:

- Transportation Incidents
- Radiological Release
- Utility Disruption
- Hazardous Materials (HazMat)

This Plan fulfills the federal mitigation planning requirements, and provides the County and its municipalities with strategies to reduce the impact of natural and manmade hazards on people and property. This Plan meets the requirements for federal mitigation funds, according to Section 104 of the Disaster Mitigation Act of 2000 and 44 CFR (Code of Federal Regulations) Part 201 for funding under the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation Program and the Hazard Mitigation Grant Program. This Plan also meets the requirements of Stafford Act and 44 CFR Part 78.5 for FEMA's Flood Mitigation Assistance Program.

This Plan was prepared by the Livingston County Hazard Mitigation Planning Committee. The Committee's members include representatives of County offices and interested municipalities and townships.

An overview of Livingston County is presented in Chapter 1, and the natural and manmade hazards that can impact the County have been assessed in Chapter 2. Goals and guidelines established by the Committee are the focus of Chapter 3. Five mitigation strategies; preventive measures, property protection, structural projects, emergency services and public information are the subjects of Chapters 4 through 8. Chapter 9 presents the Action Plan for implementation of this Plan. The Action Plan also includes items for plan maintenance.



## 1. Introduction

Livingston County is located in north-central Illinois. The County Seat is Pontiac, Illinois, which is located approximately 100 miles southwest of Chicago. Livingston County is approximately 45 miles wide (east to west) and 32 miles long (north to south), and covers approximately 1,045 square miles. Livingston County is comprised of 30 townships, and 14 municipalities.

In 2000, Livingston County had a population of 39,678, which was a decrease of 1 percent from the 1990 census, with an estimated 14,374 households. According to the U.S. Census Bureau, the incorporated municipalities located throughout the County represent about 1 percent of the County's land area. Approximately 59 percent of the County's population resides within the 14 municipalities. The 2000 census estimates that there are approximately 33,000 housing units in Livingston County. The labor force is about 18,960.

The Hazard Mitigation Planning Committee followed a standard 10-step process, based on guidance and requirements of the Federal Emergency Management Agency (FEMA). The Committee met six times from April 2010 through October 2010. They reviewed the hazards and their effects on people and property, considered a variety of ways to reduce and prevent damage, and recommended the most appropriate and feasible measures for implementation. Existing plans and programs were reviewed during the planning process. This Plan does not replace other planning efforts within the County or communities; this Plan complements those efforts.

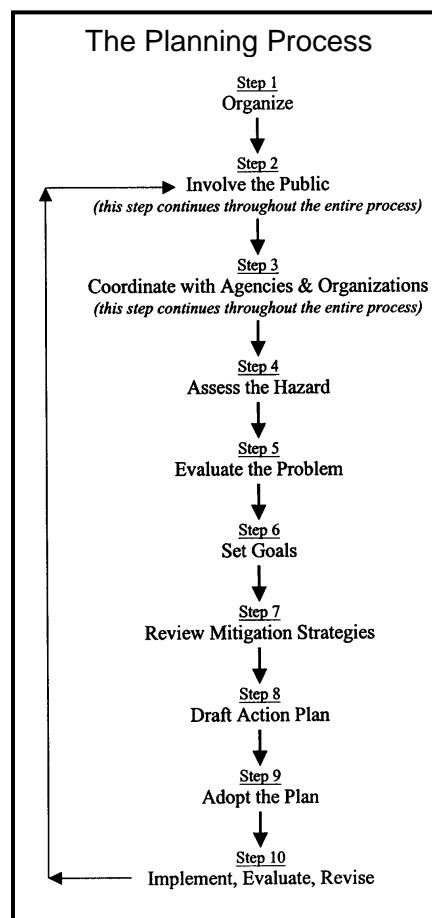
The public was invited to participate through contact with Committee members, press releases provided to local newspapers, and information on the Livingston County website. A public meeting was held on October 27, 2010 at the Pontiac City Hall.

Livingston County critical facilities have been identified in this Plan and categorized as hazardous materials sites, health facilities (hospitals and nursing homes), emergency response facilities (police and fire stations, public works sites), utilities, schools, places of assembly, and bridges. Table 1-4 in Chapter 1 summarizes the County's critical facilities.

## 2. Hazard Risk Analysis

The Committee reviewed a wide range of natural and manmade hazards, and evaluated them based on what causes them, their likelihood of occurring, and their impact on people, animals, property, critical facilities, and the local economy. The information was based on available technical studies, reports by the participating agencies and communities on their past experiences.

Natural hazards were prioritized as tornadoes, floods, severe summer storms, severe winter storms, extreme heat and extreme cold. Manmade hazards were prioritized as transportation incidents, radiological release incidents, utility disruptions, and hazardous material incidents. The following table from Chapter 2 summarizes the potential impact of natural hazards that are the focus of this Plan:



## Livingston County Summary of Hazard Probability

Hazard	Annual Chance	Impact Location	Square miles Affected	Impact on Property	Value of Vulnerable Property	Impact on Critical Facilities	Impact on Health and Safety	Economic Impact
<b>Floods</b>	1%	Floodplains	77.61	Moderate	\$100.5 million	Moderate	Moderate	Moderate
<b>Severe Summer Storms</b>	33%	Communities	1045	Moderate	\$1.08 billion	Moderate	Moderate	Moderate
<b>Severe Winter Storms</b>	100%	Countywide	1045	Low	\$1.08 billion	Low	Moderate	Moderate
<b>Tornado</b>	0.07%	Rural	5	High	\$1.78 million	Moderate	High	Moderate
	0.07%	Community	5	High	\$98.1 million	Moderate	High	Moderate
<b>Extreme Cold</b>	6.70%	Countywide	1045	Low	---	Low	High	Low
<b>Extreme Heat</b>	6.70%	Countywide	1045	Low	---	Low	High	Low
<b>Drought</b>	6.70%	Countywide	1045	Moderate	---	Low	High	Moderate
<b>Groundwater</b>	< 1%	Countywide	1045	Moderate	---	Low	High	Moderate

The vulnerability assessment estimates the past and future hazard impacts, in terms of people and costs in Livingston County. Impacts are summarized as damage to buildings, damage to critical facilities, health and safety, and economic impact (damage to businesses and infrastructure).

### 3. Goals

The Committee established hazard mitigation goals and guidelines for the planning process: The overall direction of this Plan can be summarized under the six goals established in Chapter 3:

*Goal 1. Protect the lives, health, and safety of the people of Livingston County from the impact and effects of natural and manmade hazards.*

*Goal 2. Protect public services and critical facilities from loss of use during, and potential damage from, natural and manmade hazard events.*

*Goal 3. Mitigate to protect against economic and transportation losses due to natural and manmade hazards.*

*Goal 4. Ensure that new developments do not create new exposures to damage from natural and manmade hazards.*

*Goal 5. Identify specific projects to protect lives and mitigate damage where cost-effective and affordable.*

*Goal 6. Protect historic, cultural, and natural resources from the effects of natural and manmade hazards.*

The seven guidelines below from Chapter 3 set the direction or the strategy for the mitigation activities recommended in this Plan:

*Guideline 1. Focus natural hazards mitigation efforts on floods, tornadoes, severe summer storms, severe winter storms, and extreme cold and heat events.*

*Guideline 2. Focus manmade hazard mitigation efforts on utility interruption, transportation related incidents, hazardous material incidents and radiological release incidents.*

*Guideline 3. Make people aware of the hazards they face and focus mitigation efforts on measures that allow residents and property owners to help themselves.*

*Guideline 4. Create and foster public-private partnerships to accomplish mitigation activities.*

*Guideline 5. Seek state, and federal support for mitigation efforts.*

*Guideline 6. Use available local funds, when necessary, to protect the public services, critical facilities, lives, health, and safety from natural and manmade hazards.*

*Guideline 7. Strive to improve and expand business, infrastructure, education and housing opportunities in Livingston County in conjunction with planned mitigation efforts.*

## 4. Preventive Measures

The Committee reviewed a variety of mitigation measures to protect new construction from hazards and see that future development does not increase potential losses. Preventive measures include the incorporation of this Plan into any new or revised comprehensive or land use plans to better address natural and manmade hazards. Safety for any future manufactured mobile home communities should be considered. Also, it is recommended that all communities, if not already being implemented, should consider the adoption of the International Building Codes. This recommendation asks communities *to consider* building codes.

## 5. Property Protection

Property protection measures are used to modify buildings or property subject to damage. Most measures are implemented by the property owners, so appropriate government activities include public information, technical assistance and financial support. Special attention should be given to floodplain properties, repetitively flooded areas, critical facilities in the floodplain, and safe rooms for tornadoes.

## 6. Structural Projects

The Committee recommended that each community consider the establishment a formal and regular drainage system maintenance program, and to incorporate mitigation considerations in new infrastructure.

## 7. Emergency Services

Emergency services include threat recognition, warning, response, and recovery. Warning systems are limited in the County and should be improved. The Committee also recommended communities consider becoming "StormReady."

## 8. Public Information

Public information is important for mitigation of all natural and manmade hazards. The Committee identified numerous subject areas that would benefit from a public information program. The Committee reviewed messages to convey and identified the types of media that should be used to convey those messages.

## 9. Action Plan

After a review of the recommendations from Chapters 4 through 8, the Committee created an "Action Plan" that specifies recommended projects, who is responsible for implementing them, and when they are to be done. The Action Plan is included in Chapter 9 of this *All Hazards Mitigation Plan*. A table summarizing the action items and the responsible agencies is presented on page ES-6.

There are 20 action items. The first three action items are administrative in nature, but very important for the continued success of hazard mitigation in Livingston County. These items call for the formal adoption of this Plan, the conversion of the Hazards Mitigation Planning Committee to a permanent advisory body, and plan maintenance procedures. Formal adoption ensures that County and municipal staffs are authorized and instructed to implement the action items. Adoption is also a requirement for recognition of the Plan by mitigation funding programs. The Committee will provide the mechanism and a vehicle for the Plan to be implemented, monitored, evaluated and updated. The Committee will provide a means for continued public involvement. The Committee will report to the County Board annually, and a five year update to the Plan is required for FEMA's mitigation funding programs.

Twelve of the action items are mitigation program items. Most require staff time of the County and municipal staff. About eight of the action items identify funding needed from state and federal mitigation agencies.

Five of the 19 action items are public information activities. These items are aimed directly at the Committee's established planning guideline to make people aware of the hazards that they face.

### Plan Adoption

This Plan serves to recommend mitigation measures. Implementation of these recommendations depends on adoption of this Plan by the Livingston County Board and the city council or board of trustees of each participating municipality and institution. It also depends on the cooperation and support of the offices designated as responsible for each action item.

Formal adoption of the Plan ensures that the County, municipal and township staffs are authorized and instructed to implement the action items, as resources become available. Adoption is also a requirement for recognition of the Plan by mitigation funding programs.

The County and each participating community should adopt this *Livingston County All Hazards Mitigation Plan* by passing a resolution. The County's resolution creates the permanent Mitigation Planning Committee. The municipal resolutions adopt each action item that is pertinent to the community and assigns a person responsible for it.

## Action Items, Responsible Agencies and Deadlines

Responsible Agency	Administrative			Mitigation Program												Public Information				
	1. Plan Adoption	2. Continuation of Hazard Mitigation Planning Committee	3. Plan Maintenance and Monitoring	4. Consideration of Building Codes	5. Continued Compliance with the NFIP	6. Consideration of Safety Requirements for Manufactured Home Communities	7. Drainage System Maintenance	8. Infrastructure Improvements	9. Mitigation for Floodplain Properties and Critical Facilities	10. Grant Funding for Safe Rooms	11. NIMS Compliance	12. Participation in StormReady	13. Improved Threat Recognition	14. Critical Facility Design with All Hazards Protection	15. Include the All Hazards Plan into Other Plans	16. Information for Floodplain Property Owners	17. Educate Property Owners on Safe Rooms	18. Develop Livingston Co. Public Info. Materials for Hazard Mitigation	19. Disseminate Public Information Materials on Hazard Mitigation	20. Property Protection Library – Available Free Resources
<b>Hazard Mitigation Committee</b>		✓	✓													✓	✓	✓	✓	✓
<b>Livingston County</b>																				
County Board	✓	✓		✓	☐	✓									✓					
ESDA			✓						✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Planning & Zoning				✓	☐	✓					✓				✓	✓	✓			
Transportation							✓	✓	✓		✓			✓						
Health									✓		✓			✓			✓			
<b>Municipalities</b>											☐									
City Council/Village Board	✓			✓	☐	✓					✓			✓	✓					
Administrator/Supervisor			✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Emergency Management			✓						✓		✓	✓	✓	✓		✓	✓	✓	✓	✓
NFIP Municipalities*									✓					✓	✓	✓				
Libraries									☐					☐	☐	☐			✓	✓
Other Department(s)							✓	✓	✓					✓			✓			
<b>Townships (Reading)</b>	✓		✓				☐	✓			✓			✓						
<b>Other Agencies</b>																				
Road Districts							✓	✓	✓					✓						
Schools									✓	✓	☐			✓			✓		✓	✓
<b>American Red Cross</b>																✓	✓	✓	✓	✓
Deadline for first product (months)	6	On	On	On		On	24	24	36	36	On	24	24	On	On	18	18	18	18	12

(x) Can be recommended

\* NFIP municipalities include: Dwight, Fairbury, Pontiac, and Livingston County

"On" denotes ongoing activity



# Chapter 1. Introduction

## 1.1 Overview

Livingston County, located in north-central Illinois, is subject to natural and manmade hazards that have threatened life and health, and have caused extensive property damage. Severe storms, tornadoes, and flooding impacted the County in 1974, 1982, 2008, and 2010. Severe winter storms in 1990, 1999, and 2001 led to disaster declarations. The County is vulnerable to a number of other hazards, and to better understand their potential impact on people and property, this *Livingston County All Hazards Mitigation Plan* (Plan) has been developed. This Plan identifies ways to reduce the impacts of natural and manmade hazards throughout Livingston County.



The Federal Emergency Management Agency (FEMA) defines hazard mitigation “as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event.” Hazard mitigation focuses on long-term approaches to reducing hazard vulnerability (safety risks and property damage). It does not mean that natural and manmade hazards are stopped or prevented, and it does not suggest that damage or disruption caused by natural or manmade incidents are eliminated. Natural forces are powerful and beyond our ability to control. Natural hazards can be compounded by manmade hazards and vice versa. Hazard mitigation means a comprehensive approach to minimizing the impact of hazards.

**Purpose of Planning:** Hazard mitigation planning provides a way to assess hazards and resources in order to outline a program of activities that will best mitigate the impact of hazards. A well-prepared plan should ensure that all relevant activities are reviewed and implemented so that the problem is addressed by the most appropriate and efficient solutions. It should also ensure that activities are coordinated and in keeping with other goals and activities.

An adopted community mitigation plan is a requirement for federal mitigation funds. Section 104 of the Disaster Mitigation Act of 2000 (42 USC 5165) states that local governments applying for *pre*-disaster mitigation funds must have an approved local mitigation plan. Also, a plan is needed for *post*-disaster mitigation funds under the Hazard Mitigation Grant Program. These requirements are contained in 44 CFR (Code of Federal Regulations) Part 201.

Hazard mitigation plans are sent to the Illinois Emergency Management Agency and the Federal Emergency Management Agency (FEMA) for approval. FEMA also recognizes hazard mitigation plans within the Community Rating System (CRS), which is a program that reduces flood insurance premiums for participating communities.

**Purpose of this Plan:** This Plan identifies potential natural and manmade hazards and presents activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage due to those hazards. The Plan focuses on six priority natural hazards including tornadoes, floods, severe summer storms, severe winter storms, extreme heat and extreme cold; and four manmade hazard categories, including transportation incidents, radiological release, utility disruption and hazardous materials (HazMat).

This Plan fulfills the federal mitigation planning requirements for mitigation funding, and it provides the County, the participating municipalities, townships, and organizations with an action plan for reducing the impacts of natural and manmade hazards on people and property.

## 1.2 Planning Approach

This Plan reviews a variety of mitigation alternatives and selects those that will work best for the priority hazards to be addressed. This selection process considered the current direction of the County government and the participating communities, and considered the overall damage potential from the priority hazards. The alternatives presented in this Plan also serve as a resource to the County and communities as the needs or priorities change in coming years.

**Planning Committee:** This Plan was developed under the guidance of a Hazard Mitigation Planning Committee. Livingston County communities and organizations were invited to participate. Interested municipalities and Reading Township passed resolutions stating their commitment to the Plan development.



The Committee's members include representatives of County offices, communities, the American Red Cross of the Heartland and other public and private stakeholder organizations. Neighboring Counties were also informed of the mitigation planning effort and invited to attend the Mitigation Committee meeting. A Mitigation Committee meeting schedule was prepared at the onset of the planning effort, and additional agencies, organizations and employers were provided with the schedule and encouraged to attend any or all meetings.

Participating communities and organizations of the Mitigation Committee are shown in Table 1-1. A list of all participants who attended one or more meetings is presented in Appendix A. Some small municipalities were represented by the Livingston County staff at meetings. None of the municipalities represented by the County staff have any identified Special Flood Hazard Areas (SFHA) identified by FEMA.

The Mitigation Committee met six times from April 2010 to October 2010. They reviewed the hazards and their effects on people and property, considered a variety of ways to reduce and prevent damage, and recommended the most appropriate and feasible measures for implementation.

The efforts of the Hazard Mitigation Planning Committee were coordinated by the Livingston County ESDA Director, Chuck Schopp. Other County departments provided support for the Plan development. Technical support for the Mitigation Committee and the Plan development was provided by Molly O'Toole & Associates, Ltd. (MO&A). MO&A is an engineering consulting firm that specializes in hazard mitigation. The risk assessment of manmade hazards was provided by Johnson, Depp & Quisenberry, Inc.

**Planning Process:** The Hazard Mitigation Planning Committee followed a 10-step process, based on FEMA guidance and requirements.

**Organize:** Step 1 of the planning process was to organize. Organization began with the County and MO&A in March 2010. The Hazard Mitigation Planning Committee was organized and brought together for the first meeting in April 2010. Again, the village boards or town or city councils of the participating communities were asked to pass a resolution that stated their interest and commitment to the planning effort. This was to foster the understanding of the Plan and for possible credit under the FEMA Community Rating System program.

**Table 1-1**  
**Livingston County Hazard Mitigation Planning Committee**

<b>County Departments:</b>	
Planning & Zoning	Chuck Schopp
ESDA	Chuck Schopp
Highways	David Winters
Health	MaLinda Hillman
<b>Municipalities:</b>	
Village of Campus*	County**
Village of Chatsworth*	Lori Schafer
Village of Chatsworth*	Galen Schaffer
Village of Cornell*	County**
Village of Cullom*	County**
Village of Dwight	Kevin McNamara
Village of Emington*	Annelise Fiedler
Village of Emington*	Daniel Delaney
City of Fairbury	Leroy McPherson
Village of Flanagan*	County**
Village of Forrest	County**
Village of Long Point	County**
Village of Odell*	Iris Thorne
City of Pontiac	Robert Karls
Village of Saunemin	Robert Bradford
Village of Saunemin	Steve Schaffer
Village of Strawn*	County**
<b>Townships:</b>	
Reading Township	George McMullen
<b>Stakeholders:</b>	
American Red Cross of the Heartland	Sondra Hayes
American Red Cross of the Heartland	Mike McKnight

\* No SFHAs

\*\* Representation was provided by the County staff at meetings for these municipalities.

**Public Involvement:** Step 2 of the planning process was to obtain input from the public, particularly residents and businesses that have been affected by natural hazards. The public was invited to participate through several concurrent means, including:

- Contact with Mitigation Committee members and their organizations
- A standing invitation to attend Mitigation Committee meetings
- Press releases provided to Livingston County local newspapers
- A public meeting was held on October 27, 2010, to receive comments on the draft plan

Examples of public involvement efforts are provided in Appendix B.

**Coordination:** Existing plans and programs were reviewed throughout the planning process. Plans reviewed and incorporated are discussed further in Chapters 3 and 4. This Plan does not replace other planning efforts; it is intended to complement them.

During the planning process, contacts were made with (and data collected from) regional, state, and federal agencies and organizations, including:

- U.S. Geological Survey
- National Weather Service
- Federal Emergency Management Agency
- Illinois Emergency Management Agency
- Illinois Department of Natural Resources, Office of Water Resources
- Illinois Department of Natural Resources, State Water Survey

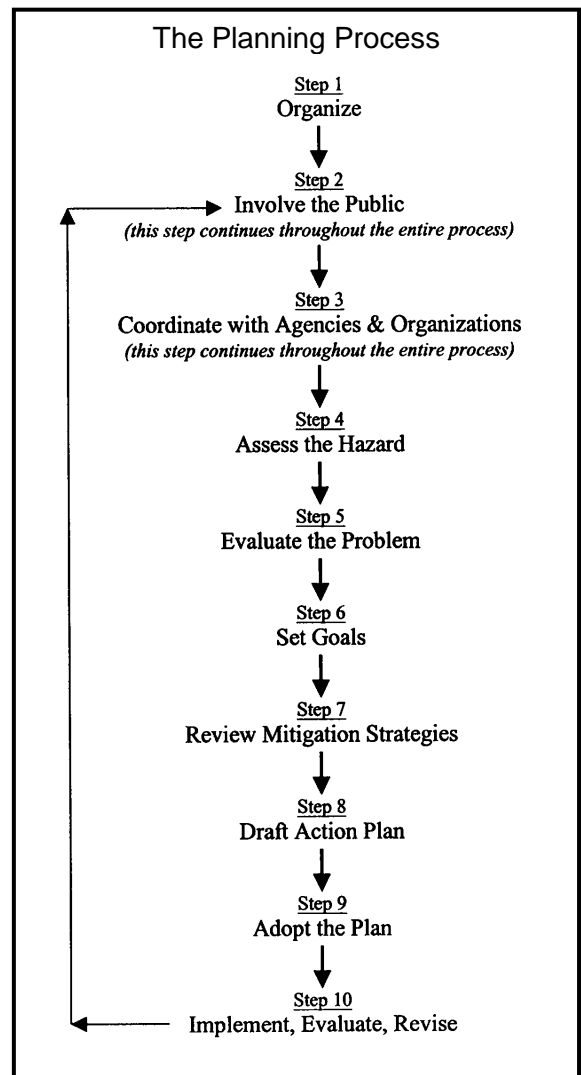
Meetings, phone conversations and e-mail exchanges were held with these agencies. During the planning process, the interested agencies were provided with meeting agendas and previous meeting's notes. At the end of the planning process, these agencies were also sent a notice requesting their review of the draft Plan. They were asked to provide any comments in time for the public meeting.

**Hazard Assessment and Problem Evaluation:** The Committee undertook steps 4 and 5 of the planning process from April to August 2010. Steps 4 and 5 make up the Plan's risk assessment. The potential hazards reviewed were based on the natural and manmade hazard identified by the Mitigation Committee. During a Mitigation Committee exercise, hazards were scored for their likelihood of occurrence or frequency, for potential impact or consequences, and for the vulnerability of the County to them. The hazard data and the Committee's findings and conclusions are covered in Chapter 2 of this Plan. Chapter 2 examines the hazards, including a hazard assessment (what causes the hazard and the likelihood of occurrence) and provides a vulnerability assessment (which estimates the impact of the hazard on life, health, and property).

**Goals:** Mitigation planning goals were developed by the Mitigation Committee. A goal setting exercise was conducted at the May 2010 meeting, and then the goals were reviewed and revised at the June 2010 meeting. The goals are presented and discussed in Chapter 3 of this Plan. Guidelines, or objectives, were also developed by the Committee during the goal setting exercise, and are presented in Chapter 3.

**Mitigation Strategies:** The Planning Committee considered a range of hazard mitigation alternatives. The Committee examined current mitigation efforts and then considered a variety of measures that could reduce the impact of the hazards. The mitigation strategies have been divided into five general categories and all measures were reviewed in relationship to the developed mitigation goals. The mitigation strategies are the subject of Chapters 4 through 8 of this Plan.

- Preventive – such as, zoning, building codes, and other development regulations.
- Property protection – such as, relocation out of harm's way, retrofitting buildings, insurance.



- Structural projects – such as, levees, reservoirs, channel improvements.
- Emergency services – such as, warning, sandbagging, evacuation.
- Public information – such as, outreach projects, technical assistance to property owners.

Action Plan: After the recommendations were developed in Chapters 4 through 8, the Mitigation Committee drafted an “Action Plan” that specifies recommended projects, who is responsible for implementing them, and when they are to be done. The Action Plan is included in Chapter 9 of this *All Hazards Mitigation Plan*.

It should be noted that this Plan serves only to recommend mitigation measures. Implementation of these recommendations depends on adoption of this Plan by the Livingston County Board and the city and town councils or boards of trustees of each participating community and institution. It also depends on the cooperation and support of the offices designated as responsible for each action item.

### 1.3 Livingston County Characteristics

Livingston County is located in north-central Illinois. The County Seat is Pontiac, Illinois, which is located approximately 100 miles southwest of Chicago. Livingston County is 45 miles wide (east to west) and 32 miles long (north to south), and covers approximately 1,045 square miles. Livingston County is comprised of 30 townships, and 14 municipalities. Livingston County is bordered LaSalle and Grundy Counties to the north, Kankakee and Ford Counties to the east, McLean and Ford Counties to the south, and LaSalle and Woodford Counties to the west. Exhibit 1-1 provides a base map of Livingston.

Transportation in the County includes Interstate-55, U.S. Highway 24 and four state highways, rail and one major airport facility in Pontiac. There are approximately 18 historic bridges in Livingston County.

**Population:** In 2000, Livingston County had a population of 39,678, which was a decrease of 1 percent from the 1990 census, with an estimated 14,374 households.

According to the U.S. Census Bureau, the incorporated municipalities located throughout the County and represent about 1 percent of the County's land area. Approximately 59 percent of the County's population reside within the 14 municipalities. The 2000 census estimates there are approximately 15,297 housing units in Livingston County, and around 70 percent are owner occupied.

Table 1-2 presents population estimated for the Livingston County municipalities, the estimated number of housing units, and the land area.

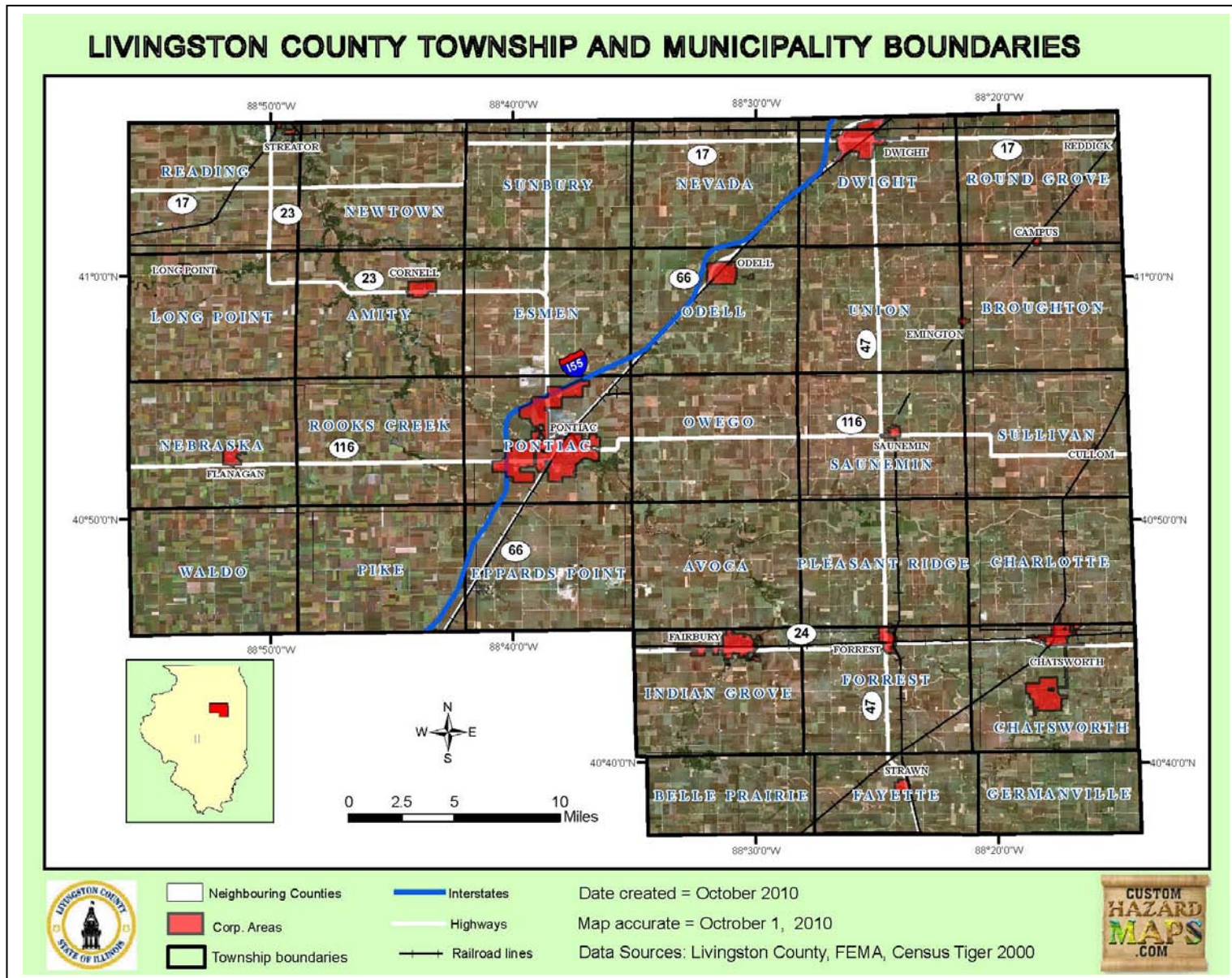


Exhibit 1-1 Livingston County Base Map



Table 1-2  
Livingston County Community Data

Community	Population	Housing Units	Square Miles	CID***	CRS Class
Village of Campus*	145	45	0.10	171199	10
Village of Chatsworth*	1,265	581	0.90	171027	10
Village of Cornell*	511	217	0.64	170823	10
Village of Cullom*	563	269	0.31	170422	10
Village of Dwight	4,363	1,803	2.57	170423	10
Village of Emington*	120	52	0.10	171203	10
City of Fairbury	3,968	1,623	1.30	170424	10
Village of Flanagan*	1,083	475	0.53	171204	10
Village of Forrest	1,225	504	0.63	170425	10
Village of Long Point	247	105	0.19	170958	10
Village of Odell*	1,014	433	1.13	171206	10
City of Pontiac	11,864	4,379	5.25	170426	10
Village of Saunemin	456	167	0.22	170824	10
Village of Strawn*	104	47	0.14	170968	10
Unincorp. Livingston Co.	12,750	4,597	1,031	171207	10
<b>Total:</b>	<b>39,678</b>	<b>15,297</b>	<b>1,045</b>		
Urban	23,330	8,792	14.00		
Rural	16,348	6,505	1,031		
Open Water**			1.70		

\* No Special Flood Hazard Areas identified by FEMA

\*\* Included in community totals; Waters of the U.S. and not including quarry ponds

\*\*\*CID is community identification number (CID) within FEMA's National Flood Insurance Program (NFIP)

**Employment:** The Livingston County labor force is about 18,960 people. Approximately 76 percent of the labor force is under private employment, 9 percent self-employed and 14 percent government employed. Major employers in Livingston County include RR Donnelly, Caterpillar, Vactor, OSF Saint James-John W. Albrecht Medical Center, Fox Development Center, Nichols-Homeshield, Evenglow Lodge, Fairview Haven, Interlake-Mecalux, Dave's Supermarket, Futures Unlimited, Asta Care Center, Exact Packaging and Livingston Manor. Also a major employer is the Illinois Department of Corrections at the Pontiac Correctional Center and the Dwight Correctional Center.

**Climate:** Livingston County has around 190 sunny days per year. The average high temperature in summer is 85 degrees °F (nighttime low is 62 degrees). The recorded high temperature is 108 degrees °F, which occurred in Pontiac in July 14, 1936. In winter, the average high temperature is 35 degrees °F (nighttime low is 18 degrees °F). The average annual rainfall is about 35 inches, and average annual snowfall is 25 inches (1971 – 2000). The lowest recorded temperature is -24 °F in Pontiac on January 23, 1909. The primary watershed in the County is the Vermilion River, which eventually drains into the Illinois River. The northeastern portion of the County drains north to the Mazon River watershed. A small area in southwestern Livingston County drains towards the Mackinaw River.

**Topography and Soils:** Most areas of Livingston County are nearly level with some gently sloping areas. The highest point in the County is 770 feet near Strawn and the lowest point is near South Streator in the Vermilion River floodplain. Soils are formed from a combination of glacial till, glacial outwash, loess, lacustrine deposits, and alluvium. Deposits occur on the till plains and moraines, outwash plains, and lake plains. The glacial deposits are underlain by Pennsylvania limestones, coals, and associated sedimentary rock. Upland soils are silty clay loams, derived from loess with a mixture of glacial till, which are very fertile except where underlain by the relatively impervious plastic clay subsoil.

## 1.4 Livingston County Land Use and Development

Livingston County's predominate land use is agricultural. Livingston County has the second largest area of agriculture land in the State of Illinois, and third largest as a portion of the total State agricultural land (per 1999-2000 statistics).

"Developed" or built up land use includes residential and commercial development, such as homes, businesses, and factories. Developed land is the 2.6 percent of the County, shown in Table 1-3, which is the developed area in incorporated and unincorporated area. Note that hazard mitigation is primarily concerned with developed areas of communities - where the people live and work, where the buildings that they live and work in are located. Also of concern is the infrastructure that serves the community.

Two other noticeable development areas in Livingston County are landfill and wind farm sites. Livingston Landfill is located north of the City of Pontiac. This landfill is one of the larger landfills in Illinois, serving as a major waste disposal site for central and northeastern Illinois. A large wind energy site is visible being located between Odell and Emington in the northeast quarter of Livingston County. Other wind energy sites are proposed to be developed throughout several areas if Livingston County.

Livingston County is not expected to see a significant increase in population or land development in the coming years. Some existing agricultural lands are being further used for wind farms while being farmed in row crops. Currently, one wind farm is in operation near Odell, and eight more wind farms are being considered under special use permits by the County.

**Table 1-3**  
**Livingston County Land Uses (2000)**

Land Cover Category	Square Miles	Percent of County
Urban and Built Up	27.2	2.6
Forested Land	5.3	0.5
Wetland	8.5	0.8
Agricultural	1000.6	95.7
Open Water	1.7	0.2
Barren and Exposed Land	2	0.2
<b>Total:</b>	<b>1,045</b>	<b>100.0</b>

Source: Land Cover of Illinois Statistical Summary (1999-2000)

## 1.5 Livingston County Critical Facilities

Critical facilities are buildings and infrastructure whose exposure or damage can affect the well being of a large group. For example, the impact of a flood or tornado on a hospital is greater than on a home or most businesses.

Critical facilities are generally placed into two categories:

1. Buildings or locations vital to public safety and the disaster response and recovery effort, such as police and fire stations and telephone exchanges, and



- Buildings or locations that, if damaged, would create secondary disasters. Examples of such buildings or locations are hazardous materials facilities and nursing homes.

Critical facilities are not strictly defined by any agency. For this mitigation planning effort, seven categories of critical facilities were used:

- Municipal facilities, including emergency facilities (police and fire stations, public works sites, etc.).
- County government facilities.
- Educational/school facilities.
- Places of assembly, such as theaters and places of worship.
- Bridges that would be inundated during the base or 100-year flood. These are discussed more in Chapter 2.
- Health facilities: hospitals and nursing homes.
- Airports.

Critical facilities were identified by each community participating in this Plan. These facilities are categorized and tallied, by municipality, on the Table 1-4.

Table 1-4  
Livingston County Critical Facilities

Type of Critical Facility:	Municipal/ Emergency	County/State Government	Educational/ Schools	Assembly/ Religious/ Shelter	Hospital/ Nursing Home	Public Airport	Water/ Wastewater	Power/ Substations	Ag. Services	Total
Village of Campus	1									1
Village of Chatsworth	2		1	1			1	1	1	7
Village of Cornell	1		1						1	2
Village of Cullom	1		1						2	2
Village of Dwight	3	1	3	2	1		2	1	2	13
Village of Emington	2						1	1	1	4
City of Fairbury	4		2		1		2	4	2	15
Village of Flanagan	1		2	2	1				2	5
Village of Forrest	2		3						1	5
Village of Long Point	1								1	1
Village of Odell	3		2		2		2	2	2	11
City of Pontiac	4	8	9		8		1		2	30
Village of Saunemin	2		1	1			2		1	6
Village of Strawn	1								1	1
Reading Township	4		1				1	2	-	8
Other Communities or Unincorp. Livingston Co.		1	5			1		1	13	8
<b>Total:</b>	<b>32</b>	<b>10</b>	<b>31</b>	<b>6</b>	<b>13</b>	<b>1</b>	<b>12</b>	<b>12</b>	<b>32</b>	<b>119</b>

Exhibit 1-2 provides the locations of identified critical facilities in Livingston County. Chapter 2 discusses critical facilities that are impacted by each natural hazard. Hazard mitigation measures for critical facilities are identified in Chapters 4 through 8.

Exhibit 1-3 provides a map of the Livingston County elementary school districts and Exhibit 1-4 provides a map of the Livingston County high school districts.

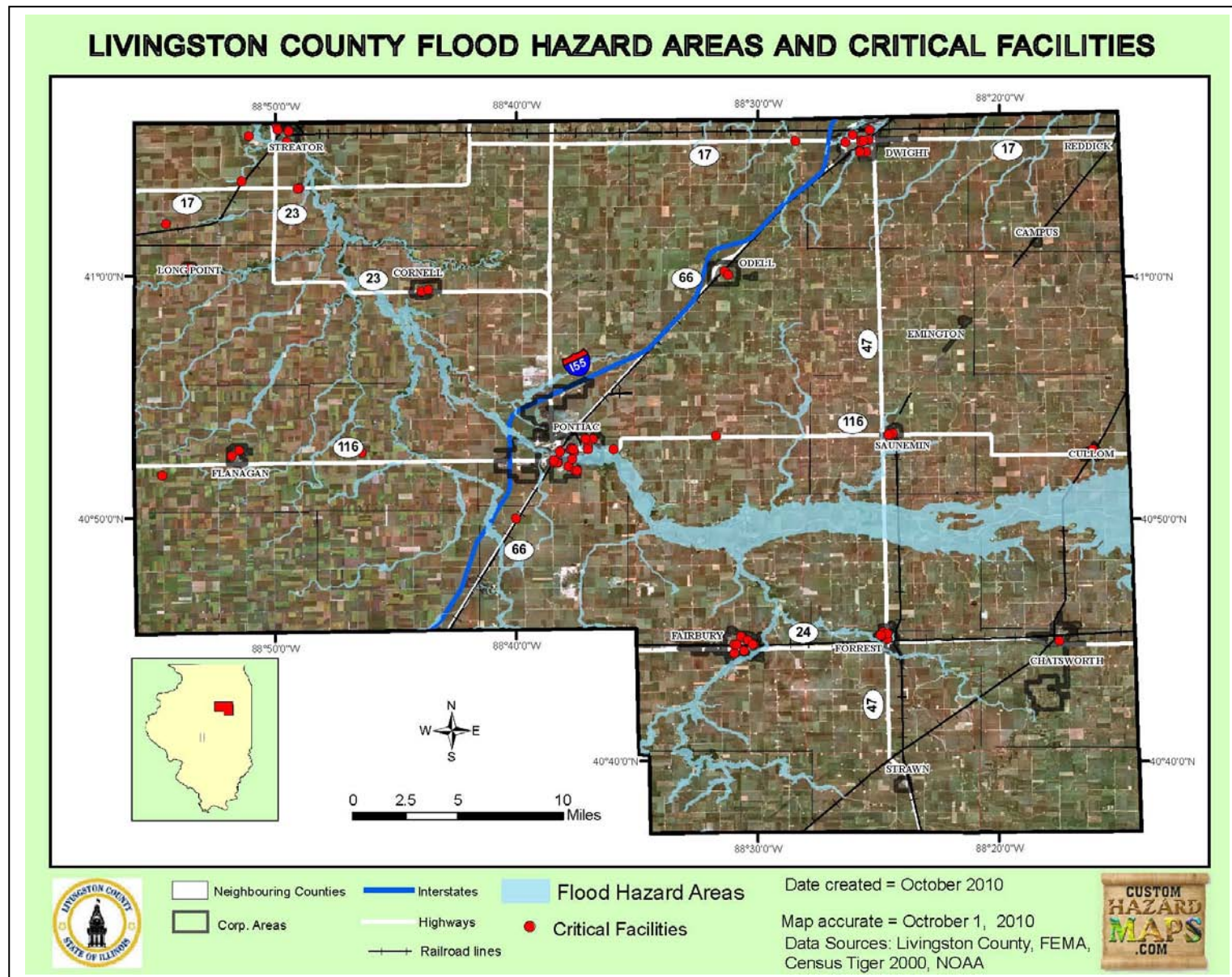


Exhibit 1-2 Livingston County Critical Facilities



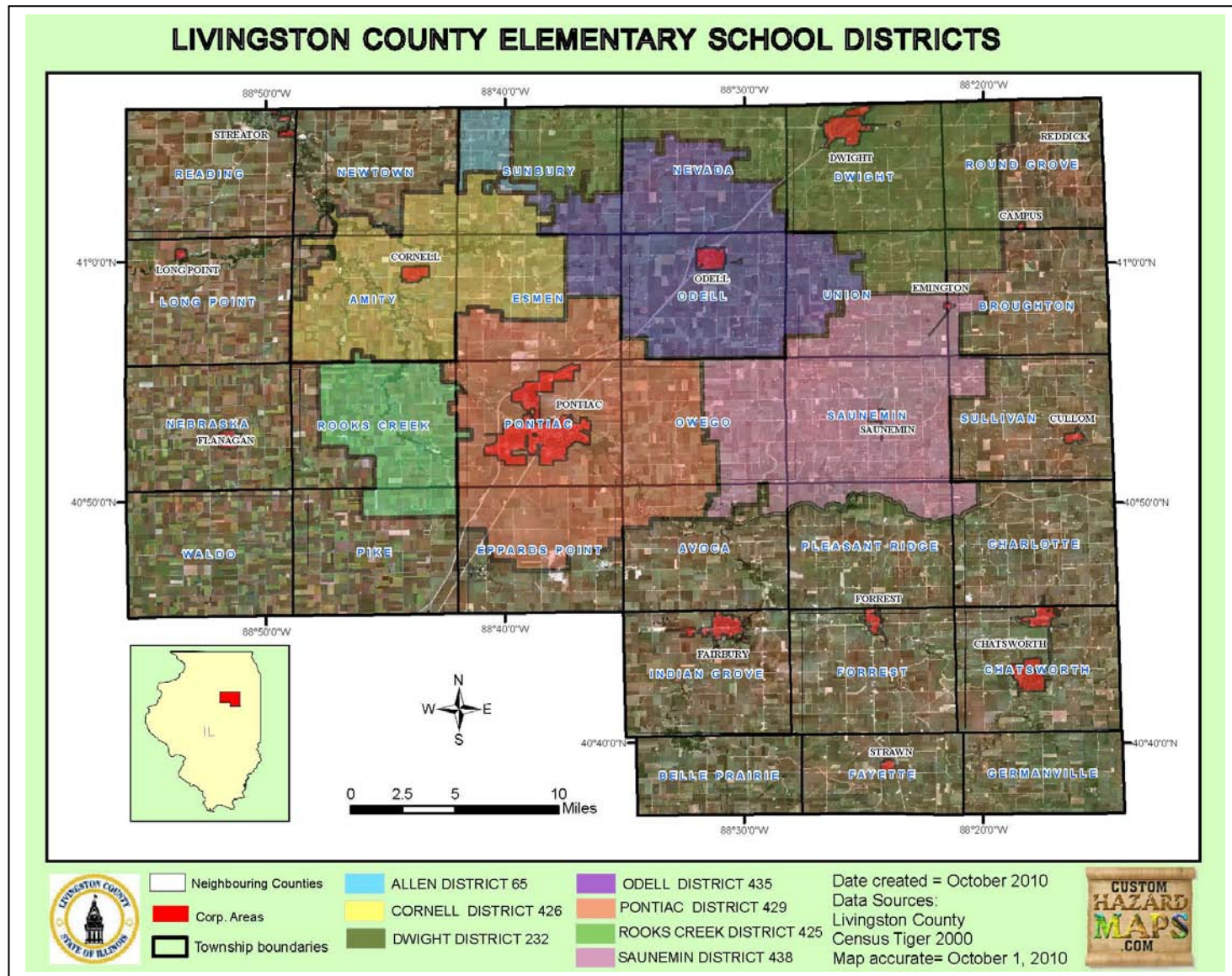


Exhibit 1-3 Livingston County Elementary School Districts

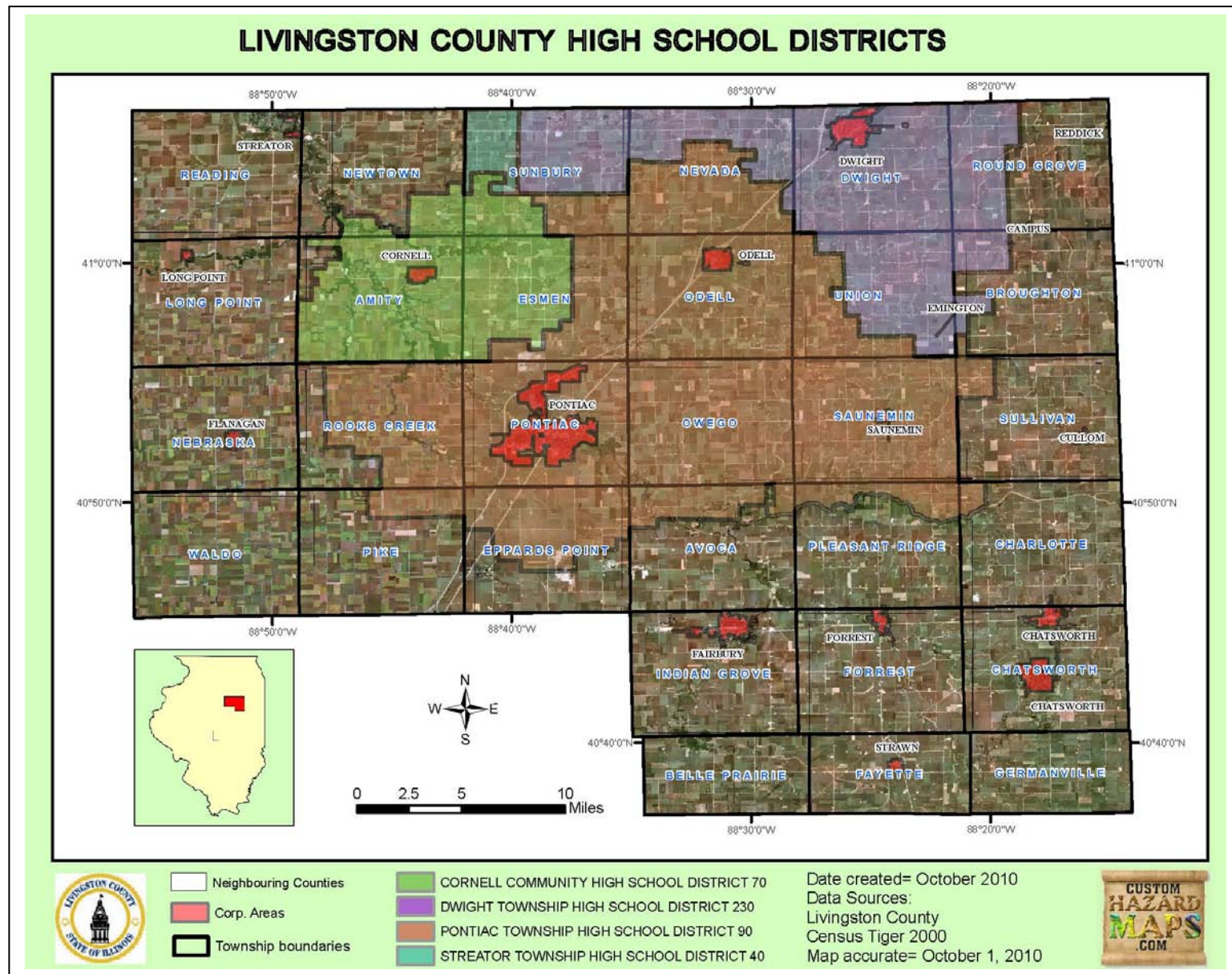


Exhibit 1-4 Livingston County High School Districts

## **1.6 References**

1. Example Plans, FEMA/Community Rating System, 2002.
2. Getting Started – Building Support for Mitigation Planning, FEMA, FEMA-386-1, 2002.
3. U.S. Census Bureau website. 2000 Census Data.
4. Survey of County offices and communities, May 2010.
5. Critical facilities data supplied by communities and County offices.
6. Illinois Emergency Management Agency.
7. Livingston County Flood Insurance Study, FEMA, 2007
8. "Climate Atlas of Illinois," Changnon, Angel, Kunkel, Lehmann, IDNR-SWS, 2004
9. "Soil Survey of Livingston County, Illinois," The Soil Conservation Service, 1996
10. Land Cover of Illinois Statistical Summary, Illinois Department of Agriculture, 1999-2000.
11. Greater Livingston County Economic Development Council website: [www.glcedc.org](http://www.glcedc.org).

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## Chapter 2. Risk Assessment

This chapter will discuss the natural and manmade hazards that could impact Livingston County and provides an assessment of the County's risk to hazards. The risk assessment consists of a hazard analysis and a vulnerability analysis for natural hazards, and a hazard analysis for manmade hazards. A vulnerability assessment of manmade hazards is not included in this Plan. The hazard analysis includes a description of the nature of the hazard, past occurrences and damages, and likelihood or probability of the hazard occurring in the future. The vulnerability analysis compares the probability of the hazard occurring against the possible impact to County assets. Livingston County assets were examined in order to understand the impact of natural hazards on health, safety and property.

A list of potential natural and manmade hazards was reviewed by the Hazard Mitigation Planning Committee at the April 2010 meeting, and priority hazards were selected for analysis. Other hazards are briefly discussed; however, the focus of this risk assessment is on the selected priority hazards. A summary of the Livingston County risk assessment is provided in Section 2.10 at the end of this chapter.

### 2.1 Potential and Prioritized Natural and Manmade Hazards

Livingston County is subject to a variety of natural hazards. While flooding has been the most significant hazard in past decades, the County has experienced damage from severe summer storms, tornadoes, and winter storm events. The most recent flooding occurred in February 2008. The most recent severe tornado event occurred in June 2010. A federal disaster was not declared in Livingston County for that event.

Flooding and severe summer and winter storm damage have warranted federal disaster declarations over the past 39 years. Table 2-1 lists the presidential, or federal, disaster declaration for the County since 1967. Typically the disaster event occurs one to two months prior to the declaration date.

**Table 2-1  
State and Federal Disaster Declarations for Livingston County**

Disaster Type	Fall	Winter	Spring	Summer	Declaration Date	FEMA Disaster Number	Neighboring Counties Also Declared
Flood				X	10-Jun-74	438	Grundy, LaSalle, Woodford
Severe Storm(s)/Flood		X			13-Dec-82	674	Woodford
Snow		X			6-Mar-90	860	McLean
Snow		X			8-Jan-99	3134	Grundy, Kankakee, McLean, Woodford
Snow		X			17-Jan-01	3161	Grundy, McLean
Hurricane Katrina*				X	7-Sep-05	3230*	Grundy, McLean, Woodford
Severe Storm(s)/Flood		X			7-Mar-08	1747	--

\* For costs of evacuation and sheltering for southern states.  
Source: FEMA

Table 2-2 shows the natural hazards that Livingston County could potentially experience and the past frequency of the listed hazards.

**Table 2-2**  
**Livingston County Identified and Potential Hazards**

Hazard	Area affected or potentially affected (Location)	Past Frequency Occurrences in the last number of years		
		Last 5 years	Last 10 years	Last 30 years
Dam Failure	Downstream areas	0	0	--
Drought	Countywide	2	--	--
Earthquake	Countywide	--	--	--
Extreme heat	Countywide	0	0	1
Extreme cold	Countywide	3	4	--
Flood occurrences	Countywide	10	17	20+
Hail*	Storm location	14	35	55+
Thunderstorm-wind*	Storm location	26	56	100+
Tornado	Storm location	6	18	30+
Winter Storm – Ice	Countywide	0	0	2+
Winter Storm – Snow	Countywide	12	16	25+

\* Elements of severe summer storms.

-- No data available.

Sources: U.S. National Oceanic and Atmospheric Administration, National Climate Data Center and FEMA.

The Planning Committee undertook an exercise to evaluate the listed hazards in order to determine the level of attention that the hazard warranted in this Plan. Each member the Planning Committee looked at the expected frequency, impact or consequences of the event and the area of the County or their community that is vulnerable to the hazard and assigned a point score for each hazard and category. The results were tallied and ranked based on adding all factors (Frequency + Impact + Area = Ranking), and based on the hazard being a direct concern to the participating communities.

The Planning Committee selected the following priority natural hazards:

- Tornadoes
- Floods
- Severe Summer Storms
- Severe Winter Storms
- Extreme Heat
- Extreme Cold

Lightning, thunderstorms, and hail storms are combined under the category of severe summer storms, and snow events, ice storms, and extreme cold are combined under the category of severe winter storms. A summary of the Planning Committee's ranking of hazards is shown in Table 2-3.



**Table 2-3**  
**Livingston County Planning Committee Ranking of Potential Natural Hazards**

<b>Natural Hazard:</b>		<b>Future Frequency:</b>	<b>Impact:</b>	<b>Area Affected:</b>
<b>Priority</b>	<b>Tornado</b>	Likely	Serious-Catastrophic	Community
	<b>Floods</b>	Likely	Serious	Community
	<b>Severe Summer Storms</b>	Likely-Frequent	Moderate	Community
	<b>Severe Winter Storms</b>	Likely-Frequent	Moderate	Large
	<b>Extreme Heat</b>	Likely	Moderate	Large
	<b>Extreme Cold</b>	Likely	Moderate	Large
<b>Other</b>	Drought	Seldom	Low-Moderate	Large
	Earthquake	Seldom	Low	Large
	Dam Failure	Seldom	Low	Community
	Groundwater	Seldom	Low-Moderate	Large

The "priority" natural hazards listed in Table 2-3 are discussed in detail in this chapter, and mitigation activities for each hazard are identified in Chapters 4 through 8. Other natural hazards have been identified and discussed by the Planning Committee, but not addressed in detail in this Plan at this time.

Information and data for the hazard analysis were collected from the municipalities, regional, state and federal agencies. Other data was developed from Livingston County records and the County's geographic information system (GIS). An important source of information on recorded events was the National Climate Data Center (NCDC) at the U.S. National Oceanic and Atmospheric Administration.

For the vulnerability analysis on natural hazards, the County GIS was used by the consultant to evaluate Livingston County's exposure to floods and severe storms. The use of FEMA's HAZUS software was not warranted for this Plan for wind or earthquake events. Wind events were evaluated based collected data for critical facilities and current property valuations. For earthquakes, Illinois Emergency Management Agency contracted with a consultant to examine the statewide earthquake risk. The results of that investigation are included with the supporting documentation to the 2007 Illinois Natural Hazards Mitigation Plan by IEMA.

The Planning Committee undertook the same exercise to examine potential natural hazards to identify and evaluate potential manmade hazards. The results were tallied and ranked based on adding all factors (Frequency + Impact + Area = Ranking), and based on the hazard being a direct concern to the participating communities. Table 2-4 provides a list of manmade hazards selected by the Planning Committee to be included in this risk assessment.

**Table 2-4**  
**Livingston County Planning Committee List of Priority Manmade Hazards**

<b>Manmade Hazards:</b>	<b>Future Frequency:</b>	<b>Impact:</b>	<b>Area Affected:</b>
<b>Transportation Incidents</b>	Seldom-Occasional	Severe-Catastrophic	Large
<b>Radiological Release</b>	Likely	Moderate	Community
<b>Utility Disruption</b>	Likely	Moderate-Severe	Community-Large
<b>HAZMAT</b>	Seldom	Moderate	Community
<b>Other Incidents</b>	Occasional	Moderate	Site-Community

## 2.2 Livingston County Assets and Property Values

### 2.2.1 Assets

Livingston County's assets include people, buildings, infrastructure, businesses and institutions, the land and natural resources. These assets are summarized in Table 2-5 for purposes of evaluating potential hazards against the potential damage or loss of assets.

**People:** Most residents of Livingston County also work in Livingston County or attend Livingston County schools.

**Residents:** According to the 2000 U.S Census, the total Livingston population is 39,678. A list of populations by municipality is provided in Table 1-2 in Chapter 1. Population by township is shown below in Table 2-5. A base map of Livingston County is also provided in Chapter 1 (Figure 1-1).

**Table 2-5**  
**Livingston County Township Population and Density**

<b>Township</b>	<b>Population</b>	<b>Square Miles</b>	<b>Density</b>
Amity	869	36.37	23.9
Avoca	386	36.40	10.6
Belle Prairie	91	22.87	4.0
Broughton	290	35.23	8.2
Charlotte	192	35.84	5.4
Chatsworth	1468	36.03	40.7
Dwight	5625	34.84	161.5
Eppards Point	472	36.48	12.9
Esmen	367	36.16	10.1
Fayette	264	22.71	11.6
Forrest	1597	36.36	43.9
Germanville	73	22.93	3.2
Indian Grove	4315	36.32	118.8
Long Point	542	36.49	14.9
Nebraska	1494	36.50	40.9
Nevada	212	36.52	5.8
Newtown	723	36.22	20.0
Odell	1208	36.06	33.5
Owego	336	36.15	9.3
Pike	303	36.42	8.3
Pleasant Ridge	302	36.36	8.3
Pontiac	13148	36.35	361.7
Reading	2247	37.79	59.5
Rooks Creek	568	36.45	15.6
Round Grove	411	36.24	11.3
Saunemin	690	36.06	19.1
Sullivan	738	35.58	20.7
Sunbury	235	36.50	6.4
Union	253	35.26	7.2
Waldo	259	36.45	7.1
<b>Totals:</b>	<b>39,678</b>	<b>1,045</b>	<b>38</b>

*Source: Livingston County Assessor's Office (based on 2000 U.S. Census)*

Township populations are used to compare to assessed values of property that are developed by township. In Table 2-5, it is worth noting that the average density in Livingston County is 38 persons per square mile, while the average density of people in the State of Illinois is 223 persons per square mile. .

**Buildings Assets:** Table 2-6 provides parcel and assessed value data for taxable properties in Livingston County. The assessed values are from the 2009 assessments. Not all structures in the County are captured by these numbers. Government owned buildings is an estimate made for the purposes of this plan for the participating communities. It includes village halls, police and fire stations, public works buildings, libraries, and schools. The State-owned prisons (Dwight and Pontiac) and the prison populations were not included in the analysis.

Housing units: The 2000 U.S. Census estimated 15,297 housing units in Livingston County. The Assessor's data in Table 2-6 shows the 13,376 residential (non-farmsite) homes and 1,577 farmsite homes, or a total of 14,953 housing units. The Assessor's data was used in the analysis. The total housing units represents the County's residential exposure to hazards. Housing units in Livingston County will be used for calculating overall vulnerability of the County. There are an estimated 335,621 housing units within Livingston County.

Manufactured housing (mobile homes): There are seven manufactured home communities in Livingston County, one in Dwight, one in Fairbury, four in Pontiac and one in unincorporated South Streator (Reading Township). Though not located in recognized manufactured home communities, manufactured housing can be found as housing development throughout the incorporated and unincorporated areas of Livingston County. These homes are particularly vulnerable to damage from wind-related hazards.

Housing Density: The average density of housing in Livingston County is approximately 14.3 housing units per square mile. The average housing unit density for the State of Illinois is 88 housing units per square mile. Housing density in the City of Pontiac is 833 homes per square mile.

Commercial and industrial buildings: As shown in Table 2-6, there are nearly 2,000 commercial and industrial buildings in Livingston County (businesses, hospitals, manufacturing, etc.).

**Farms Assets:** There are over 10,000 farms in Livingston County. As mentioned above, farm home sites are included with the residential building count.

**Infrastructure Assets:** Infrastructure, beyond transportation-related infrastructure, includes water mains, sewers, treatment plants, and utilities (electrical distribution, natural gas lines, and communication networks). Estimates of these infrastructure areas have not been made for purposes of this plan.

#### **Summary – Population and Housing Density:**

Livingston County:	1,045 square miles
Population Density:	38 persons per square mile (2000)
Density of housing units:	14 homes per square mile
Density of housing units in urban areas:	833 homes per square mile
Density of housing units in rural areas:	11 homes per square mile

Note that densities for housing units in urban areas and in rural area are both used in the vulnerability assessment to compare potential levels of damage in different areas of the County.

**Table 2-6**  
**Estimate of Housing Units per Community**

<b>Township</b>		<b>Residential</b>	<b>Farm Homesite*</b>	<b>Farm</b>	<b>Commercial</b>	<b>Industrial</b>	<b>Other</b>	<b>Total</b>
Amity	Parcels	401	70	366	41	-	4	812
	Assessed Value	\$9,106,096	\$3,037,611	\$3,001,760	\$626,696	\$ -	\$ 1,545	\$15,773,708
Avoca	Parcels	131	69	446	3	-	-	580
	Assessed Value	\$4,871,204	\$3,520,608	\$3,198,929	\$67,149	\$ -	\$ -	\$11,657,890
Belle Prairie	Parcels	24	31	256	-	-	2	282
	Assessed Value	\$919,710	\$1,251,962	\$3,975,053	\$ -	\$ -	\$671	\$ 6,147,396
Broughton	Parcels	103	55	310	23	-	1	437
	Assessed Value	\$2,973,420	\$2,648,937	\$3,042,257	\$ 173,531	\$ -	\$14,136	\$8,852,281
Charlotte	Parcels	40	34	294	14	1	-	349
	Assessed Value	\$1,434,358	\$1,179,760	\$2,905,397	\$874,384	\$3,173	\$ -	\$6,397,072
Chatsworth	Parcels	581	48	282	82	2	4	951
	Assessed Value	\$11,284,132	\$ 1,625,091	\$ 2,804,946	\$1,286,873	\$469,972	\$9,356	\$17,480,370
Dwight	Parcels	1,564	51	266	214	1	1	2,046
	Assessed Value	\$67,473,611	\$2,295,567	\$2,593,473	\$12,376,899	\$ 2,168,649	\$21,121	\$ 86,929,320
Eppards Point	Parcels	107	47	361	11	-	1	480
	Assessed Value	\$5,364,270	\$2,302,891	\$3,330,228	\$1,293,581	\$ -	\$188	\$12,291,158
Esmer	Parcels	118	62	299	12	-	-	429
	Assessed Value	\$3,459,219	\$2,696,421	\$1,824,801	\$6,441,728	\$ -	\$ -	\$14,422,169
Fayette	Parcels	77	38	200	23	-	4	304
	Assessed Value	\$1,985,399	\$1,466,382	\$3,464,874	\$327,817	\$ -	\$43,207	\$7,287,679
Forrest	Parcels	587	60	417	94	3	1	1,102
	Assessed Value	\$15,746,926	\$2,681,122	\$4,778,136	\$3,741,026	\$107,847	\$40,007	\$27,095,064
Germanville	Parcels	17	19	196	1	-	-	214
	Assessed Value	\$680,687	\$471,211	\$2,355,630	\$15,145	\$ -	\$ -	\$3,522,673
Indian Grove	Parcels	1,634	76	463	286	5	1	2,389
	Assessed Value	\$53,681,649	\$3,489,444	\$4,102,376	\$11,767,114	\$1,579,799	\$37,983	\$74,658,365
Long Point	Parcels	196	54	393	33	-	2	624
	Assessed Value	\$4,768,143	\$2,201,359	\$4,678,749	\$730,542	\$ -	\$ 3,354	\$12,382,147
Nebraska	Parcels	538	58	388	72	-	-	998
	Assessed Value	\$16,366,096	\$2,280,815	\$4,130,627	\$1,727,489	\$ -	\$ -	\$24,505,027
Nevada	Parcels	58	47	263	18	-	-	339
	Assessed Value	\$2,730,440	\$2,225,481	\$2,139,552	\$621,466	\$ -	\$ -	\$7,716,939
Newtown	Parcels	351	71	376	20	-	-	747
	Assessed Value	\$9,880,721	\$2,681,365	\$2,886,291	\$664,203	\$ -	\$ -	\$16,112,580
Odell	Parcels	523	53	318	61	-	1	903
	Assessed Value	\$15,722,616	\$2,955,278	\$1,945,004	\$1,430,274	\$ -	\$5,004	\$22,058,176
Owego	Parcels	100	41	298	6	-	-	404
	Assessed Value	\$4,526,318	\$2,081,330	\$2,259,897	\$469,300	\$ -	\$ -	\$9,336,845

**Table 2-6**  
**Estimate of Housing Units per Community - continued**

Township		Residential	Farm Homesite*	Farm	Commercial	Industrial	Other	Total
Pike	Parcels	46	67	372	1	-	-	419
	Assessed Value	\$1,651,629	\$2,532,661	\$3,431,135	\$57,422	\$ -	\$ -	\$7,672,847
Pleasant Ridge	Parcels	75	42	331	9	-	1	416
	Assessed Value	\$2,206,768	\$2,071,566	\$2,745,092	\$257,535	\$ -	\$5,704	\$7,286,665
Pontiac	Parcels	3,874	70	324	682	7	3	4,890
	Assessed Value	\$127,592,706	\$3,777,221	\$2,446,955	\$47,687,102	\$ 7,753,104	\$3,510	\$189,260,598
Reading	Parcels	1,040	68	363	60	6	-	1,469
	Assessed Value	\$21,468,721	\$2,292,549	\$4,683,010	\$3,757,939	\$1,751,634	\$ -	\$33,953,853
Rooks Creek	Parcels	216	63	421	17	-	-	654
	Assessed Value	\$8,662,474	\$2,540,750	\$3,572,120	\$1,431,021	\$ -	\$ -	\$16,206,365
Round Grove	Parcels	195	39	259	26	-	1	481
	Assessed Value	\$4,675,804	\$2,045,637	\$3,688,701	\$751,844	\$ -	\$ -	\$11,161,986
Saunemin	Parcels	261	55	364	45	-	2	672
	Assessed Value	\$5,876,172	\$2,129,305	\$3,210,147	\$963,842	\$ -	\$425	\$12,179,891
Sullivan	Parcels	323	48	349	46	-	-	718
	Assessed Value	\$8,528,422	\$1,860,647	\$3,428,665	\$1,430,271	\$ -	\$ -	\$15,248,005
Sunbury	Parcels	70	45	290	28	-	-	388
	Assessed Value	\$1,972,107	\$1,702,300	\$1,835,691	\$1,186,280	\$ -	\$ -	\$6,696,358
Union	Parcels	71	46	268	8	-	-	347
	Assessed Value	\$2,121,606	\$1,853,980	\$2,331,752	\$26,019	\$ -	\$ -	\$6,333,357
Waldo	Parcels	55	50	470	-	-	-	525
	Assessed Value	\$2,311,905	\$2,003,236	\$3,665,122	\$ -	\$ -	\$ -	\$7,980,263
County Totals:	Parcels	13,376	1,577	10,003	1,936	25	29	25,369
	Assessed Value	\$420,043,329	\$67,902,487	\$94,456,370	\$102,184,472	\$13,834,178	\$186,211	\$698,607,047

\*Farm homesite parcels included in "Farm Parcels"

Source: Livingston County Assessor's Office based on 2009 property assessments)

## 2.2.2 Property Value

Assessed property values in Livingston County are presented in Table 2-6. Assessed values in Table 2-6 include both the value of the parcel of land and any improvements on the parcel (e.g., buildings). Residential property market value can be estimated by multiplying the assessed valuation of the home and property by three. Non-residential properties generally need to be appraised to determine their property value.

**Building Value:** For cost-benefit analyses, FEMA requires the use of replacement cost of buildings. Replacement cost estimates a structure's features and the determination of a per-square-foot replacement cost. A calculation of replacement cost does not include the value of the land.

**Residential:** In a natural hazard event, the building incurs the damage, therefore it is appropriate to use only the value of the building. Since replacement costs are not being determined for this risk assessment, the value of residential building is estimated by the following equation:

*Livingston County Building Values = Assessed value multiplied by three and multiplied by 50%*

**Manufactured Homes:** The value of manufactured homes is estimated to be \$38,000 (U.S. Census default data).

**Commercial and Industrial:** The value of commercial and industrial buildings is taken as the assessed value times three, since often the value of a non-residential buildings varies and is typically much higher than residential structures.

**Farmland Value:** The total assessed farmland value in Livingston County is \$94.46 million. The assessed value is taken as the market value of the farmland.

**Government-Owner and Tax-Exempt Property Value:** The value of government-owned property in Livingston County is being collected by the County Auditor, as it is submitted by local government agencies. The value of tax-exempt properties, such as churches, is not readily known.

**Building Value Summary:** With consideration of the median home price and the U.S. Census Bureau replacement cost of non-residential structures, the average building values shown in Table 2-7 were used throughout this chapter for the vulnerability analysis

The total estimated value of all buildings in Livingston County is \$1.08 billion.

**Table 2-7  
Livingston County Average Building Values**

<b>Building Type</b>	<b>Building Numbers</b>	<b>Assessed Property Value</b>	<b>Multiplier</b>	<b>Total Building Value</b>	<b>Average Building Value</b>
Residential	13,376	\$ 420,043,329	3 x 50%	\$630 million	\$ 47,100
Farm Homesites	1,577	\$ 67,902,487	3 x 50%	\$102 million	\$ 64,600
Commercial	1,936	\$ 102,184,472	3	\$307 million	\$ 158,300
Industrial	25	\$ 13,834,178	3	\$41 million	\$1,660,000
<b>Total:</b>	<b>16,914</b>			<b>\$1,080 million</b>	<b>--</b>

**Total Estimated Taxable Property Value:**

Value of Residential Property =  $(\$420,043,329 + \$67,902,487) \times 3 = \$1.464$  billion

Value of Commercial and Industrial Property =  $(\$102,184,472 + \$13,834,178) \times 3 = \$348$  million

Value of Farmland (Assess Value) = \$94.456 million

Total estimated market value of all private, taxable and-developed property in Livingston County = \$1.906 billion.

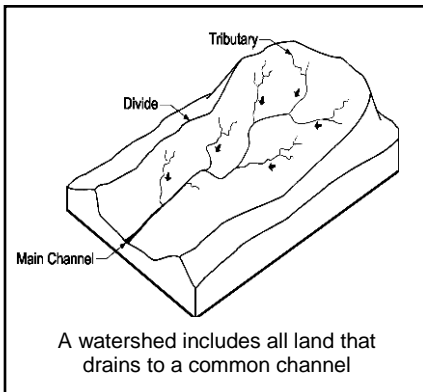
## 2.3 Floods

### 2.3.1 Flood Hazard Assessment

Livingston County is part of three major watersheds – the Vermilion River, the Illinois River and the Mackinaw River. A watershed is the land area that all rain or snowmelt will drain or “runoff” to. Within each watershed there are smaller streams that can be identified as subwatersheds. All watersheds in Livingston County eventually drain to the Illinois River. Exhibit 2-1 shows the Livingston County rivers and the elevation relief throughout the County. Exhibit 2-2 shows the Livingston County watersheds.. Table 2-8 lists Livingston County’s watersheds and subwatersheds (streams).

#### 2.3.1.1 Flood Considerations and Terminology

**Watersheds:** In a watershed, runoff from rain or snowmelt is collected by smaller channels (tributaries), which send the water to larger channels and eventually to the lowest body of water in the watershed (main channel). When a channel receives too much water, the excess flows over the banks and into the adjacent area, which is the floodplain.



**Watershed Topography and Development:** The condition of the land in the watershed affects what happens to the precipitation. For example, more rain will run off the land and into the streams if the terrain is steep. For Livingston County, a range of runoff conditions exist. The land is flat in most area of Livingston County, so travel time for runoff to a stream may be increased. However, when row crops are planted with the slope of the land, then runoff time can be increased. The conditions of saturated ground from previous rain influence the amount of precipitation that is infiltrated into the ground and the amount that must become runoff. For impervious areas of Livingston County, such as Pontiac, nearly all rainfall becomes runoff.

**Precipitation:** Livingston County receives an average of 34 inches of total precipitation each year. Average annual snowfall is 26 inches (generally, 7 inches of snow has the equivalent water content of one inch of rain).

For Livingston County, a 24-hour precipitation amount of 7 to 8 inches is considered to be a 100-year rainfall event. For a relatively short, intense rainfall event of 3 hours, the 100-year rainfall amount is 4.5 inches.

**Riverine Flooding:** The most common and most damaging floods occur along rivers and streams and this is called overbank flooding. Overbank flooding of rivers and streams can be caused by one or more of three factors:

- Too much precipitation in the watershed for the channels to convey
- Obstructions in a channel, such as an ice jam or beaver dam, and
- Large release of water when a dam or other obstruction fails.
- During a riverine flooding event other flood problems can also occur. Streets can flood when rainwater can't flow into a storm sewer. Basements can flood when rainwater can't flow away from the house or when the sewers back up. These problems are usually caused by heavy local rains and can occur when not related to overbank flooding.

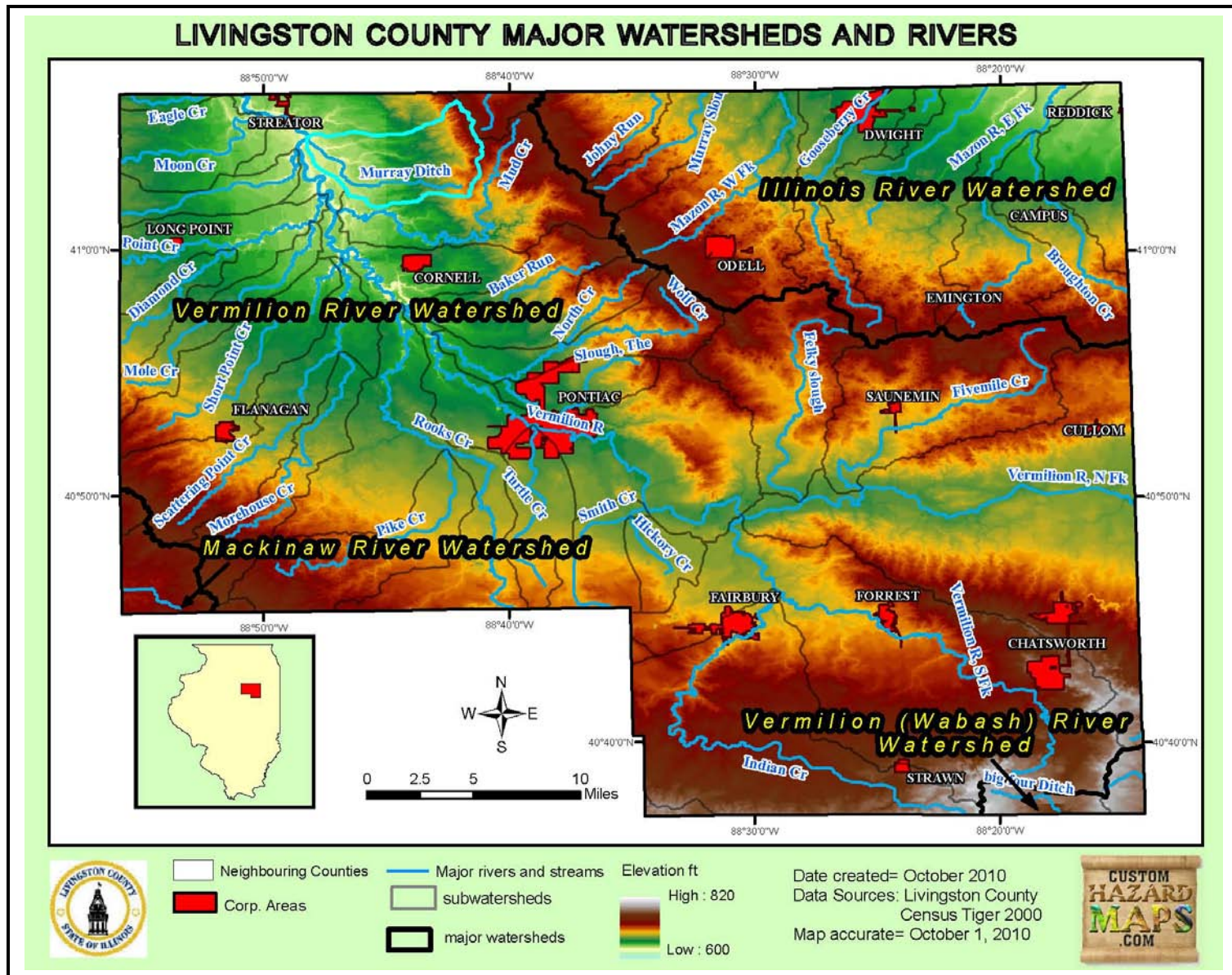


Exhibit 2-1 Map of Livingston County Rivers and Relief Elevations



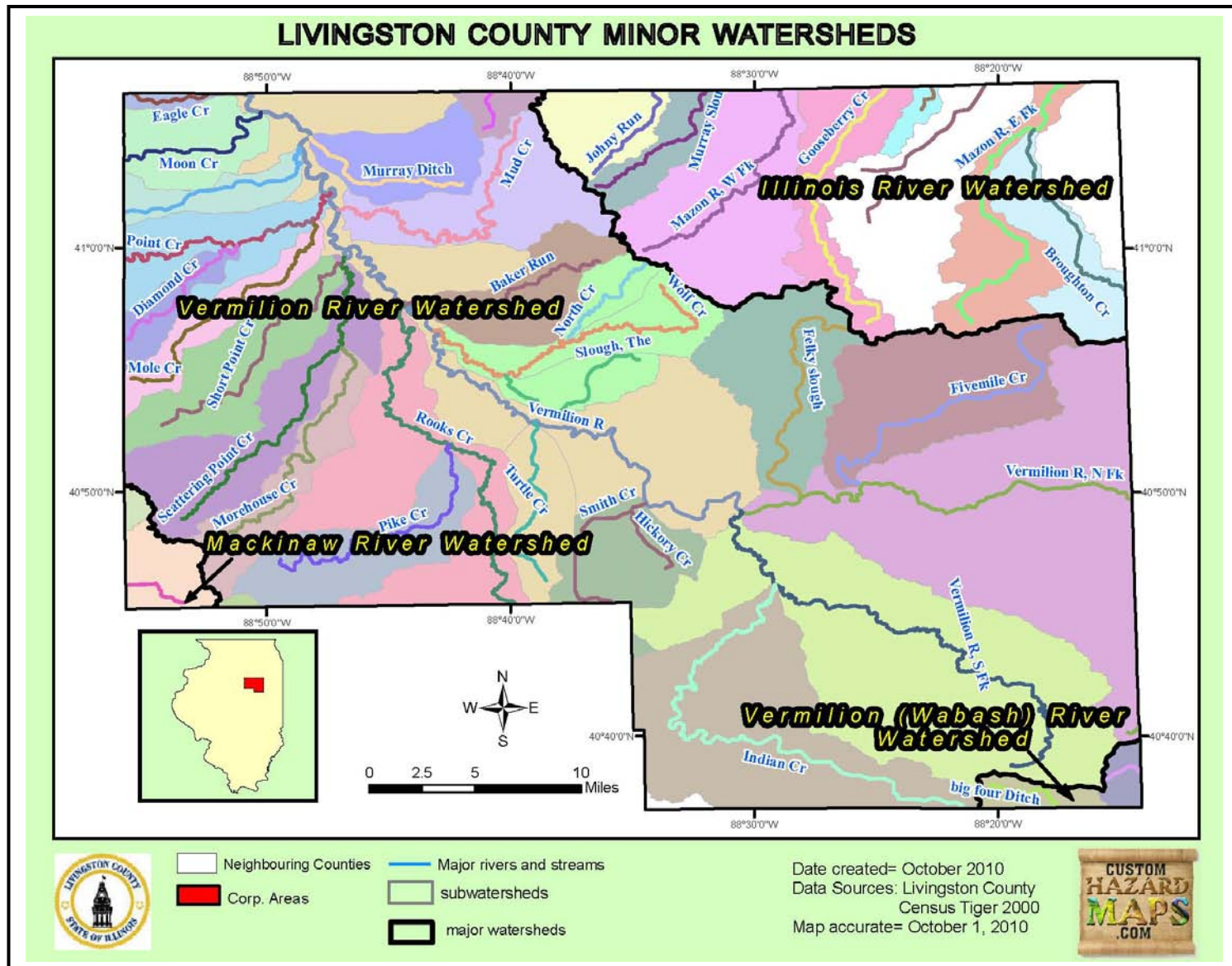


Exhibit 2-2 Map of Livingston County Watersheds

**Table 2-8**  
**Livingston County Watersheds**

Watershed:	Stream Name:	Tributary Name:	Drainage Area (In All Counties) square miles
<b>Vermilion River Watershed</b>			
	Vermilion River	At Streator	1084
	Moon Creek		
	Murray Ditch		
	Prairie Creek		
	Long Point Creek		
		Mole Creek	
	Mud Creek		
	Short Point Creek		
	Scattering Point Creek		
		Morehouse Creek	
	Ida Creek		
	Rooks Creek		
		Pike Creek	
	Baker Creek		
	Wolf Creek		
		The Slough	
		North Creek	
	Turtle Creek		
	Vermilion River	At Pontiac	579
	Smith Creek		
	Hickory Creek		
	North Fork		324
		South Fork	187
		Indian Creek	
		Felky Slough	
		Five Mile Creek	43
	North Fork	near County Line	186
<b>Illinois River Watershed</b>			
	Johnny Creek		
	Murray Slough		
	West Fork Mazon River		
	Gooseberry Creek		
	East Fork Gooseberry Creek		
		Boughton Creek	
<b>Mackinaw River Watershed</b>			
	Panther Creek		

**Flash Floods:** Flash floods are generated by severe storms that drop much rainfall in a short time. All flash floods strike quickly and end swiftly. In urban areas, flash flooding can occur where impervious surfaces, gutters and storm sewers speed runoff. Flash floods also can be caused by dam failure, the release of ice-jam flooding, or the collapse of a debris dam.

**Obstructions:** Obstructions can be channel obstructions, such as small bridge openings or log jams, or floodplain obstructions, such as road embankments, fill and buildings. Channel obstructions will cause smaller, more frequent floods, while floodplain obstructions impact the larger, less frequent floods where most of the flow is overbank, outside the channel.

### What are the odds of a flood?

The term "100-year flood" has caused much confusion for people not familiar with statistics. Another way of looking at it is to think of the odds that a base flood will happen sometime during the life of a 30-year mortgage (26% chance).

#### Chance of Flooding over a Period of Years

Period	Flood Size			
	10-year	25-year	50-year	100-year
1 year	10%	4%	2%	1%
10 years	65%	34%	18%	10%
20 years	88%	56%	33%	18%
30 years	96%	71%	45%	26%
50 years	99%	87%	64%	39%

Even these numbers do not convey the true flood risk because they focus on the larger, less frequent, floods. If a house is low enough, it may be subject to the 10- or 25-year flood. During the proverbial 30-year mortgage, it may have a 26% chance of being hit by the 100-year flood, but the odds are 96% (nearly guaranteed) that a 10-year flood will occur during the 30 year period. Compare those odds to the only 5% chance that the house will catch fire during the same 30-year mortgage.

Obstructions can be natural or manmade. Natural obstructions, like log jams, can be cleared out or are washed away during larger floods. Livingston County also has a history of problems with beaver dams. The greater problem is manmade obstructions, which tend to be more permanent. They are discussed in Chapter 4's section on floodways.

**Flood Risk:** Past floods are indications of what can happen in the future, but flood studies and mitigation plans are based on the risk of future flooding. Flood studies extrapolate from historical records to determine the statistical potential that storms and floods of certain magnitude will recur. Such events are measured by their "recurrence interval," i.e., a 10-year storm or a 50-year flood.

These terms are often misconstrued. Commonly, people interpret the 50-year flood definition to mean "once every 50

years." This is incorrect. Statistically speaking, a 50-year flood has a 1/50 (2 %) chance of occurring in any given year. In reality, a 50-year flood could occur two times in the same year, two years in a row, or four times over the course of 50 years. It is possible not to have a 50-year flood over the course of 100 years.

FEMA uses the "base" flood as the basis for its regulatory requirements and flood insurance rate setting; it is also the basis for this analysis. The base flood is the 1% chance flood, i.e., the flood that has a 1% (one out of 100) chance of occurring in any given year. The 1% chance flood has also been called the 100-year flood.

The "500-year flood" has a 0.2 % chance of occurring in any given year. While the odds are more remote, it is the national standard used for protecting critical facilities, such as hospitals and power plants.

**The Base Floodplain:** The area inundated by the base flood is the "base floodplain." FEMA maps (called Flood Insurance Rate Maps, or FIRMs) also call this the Special Flood Hazard Area or A Zone.

The central part of the floodplain is called the floodway. The floodway is the channel and that portion of the adjacent floodplain which must remain open to permit passage of the base flood. Floodwaters generally are deepest and swiftest in the floodway, and anything in this area is in the greatest danger during a flood. The remainder of the floodplain is called the **fringe**, where water may be shallower and slower.

Floodplain maps have been developed by FEMA for Livingston County. Additional flood data is included in the Livingston County Flood Insurance Study, December 2007. The Livingston County FIS includes mapped floodplain areas in unincorporated areas of the County and within Dwight, Fairbury, Long Point, Pontiac, and Saunemin. Certainly streams in the "unmapped" communities in Livingston County can experience riverine or overbank flooding, but homes or other buildings may not be impacted, or the drainage area did not warrant mapping by FEMA.

Table 2-9 shows the 100-year flood elevations for the major rivers in Livingston County, which are included in the FEMA Flood Insurance Study.

**Table 2-9**  
**Livingston County 100-year Flood Elevations**

River	Location	Approximate 100-year Flood Elevation
Vermilion River	Airport Road	633 feet
Vermilion River	Vermilion Street	639 feet
Indian Creek	Oak Street	670 feet
Gooseberry Creek	IL State Route 17	630 feet

Source: FEMA Flood Insurance Study, December 2007

**Velocity:** The speed of moving water, or **velocity**, is measured in feet per second. Flood velocity is important to mitigation because the faster water moves, the more pressure it puts on a structure and the more it will erode stream banks and scour the earth around a building's foundation. The FEMA Flood Insurance Study (FIS) typically includes the "average floodway velocity" for those streams that were studied in detail. This figure is helpful in determining the relative hazard of an area, but is not an accurate indication of the velocity of a flood at any individual site. The FIS shows floodway velocities ranging from 2 foot per second up to 6 feet per second through certain bridge openings.

**Flood Depths:** There is one stream gages in Livingston County that is jointly funded and maintained by the U.S. Geological Survey (USGS) and the Illinois Department of Natural Resources (IDNR). The gage, "USGS 05554500" is located along the Vermilion River near the Vermilion Street Bridge in Pontiac. Figure 2-1 shows a graphical representation the gage with some historical flood information. The figure was developed by IDNR.

Livingston County gage information can be found at the web sites in the box to the right.

<http://waterdata.usgs.gov/nwis/uv?05554500>

Or

**IDNR's "Flood Surveillance Bookmarks" Website:**

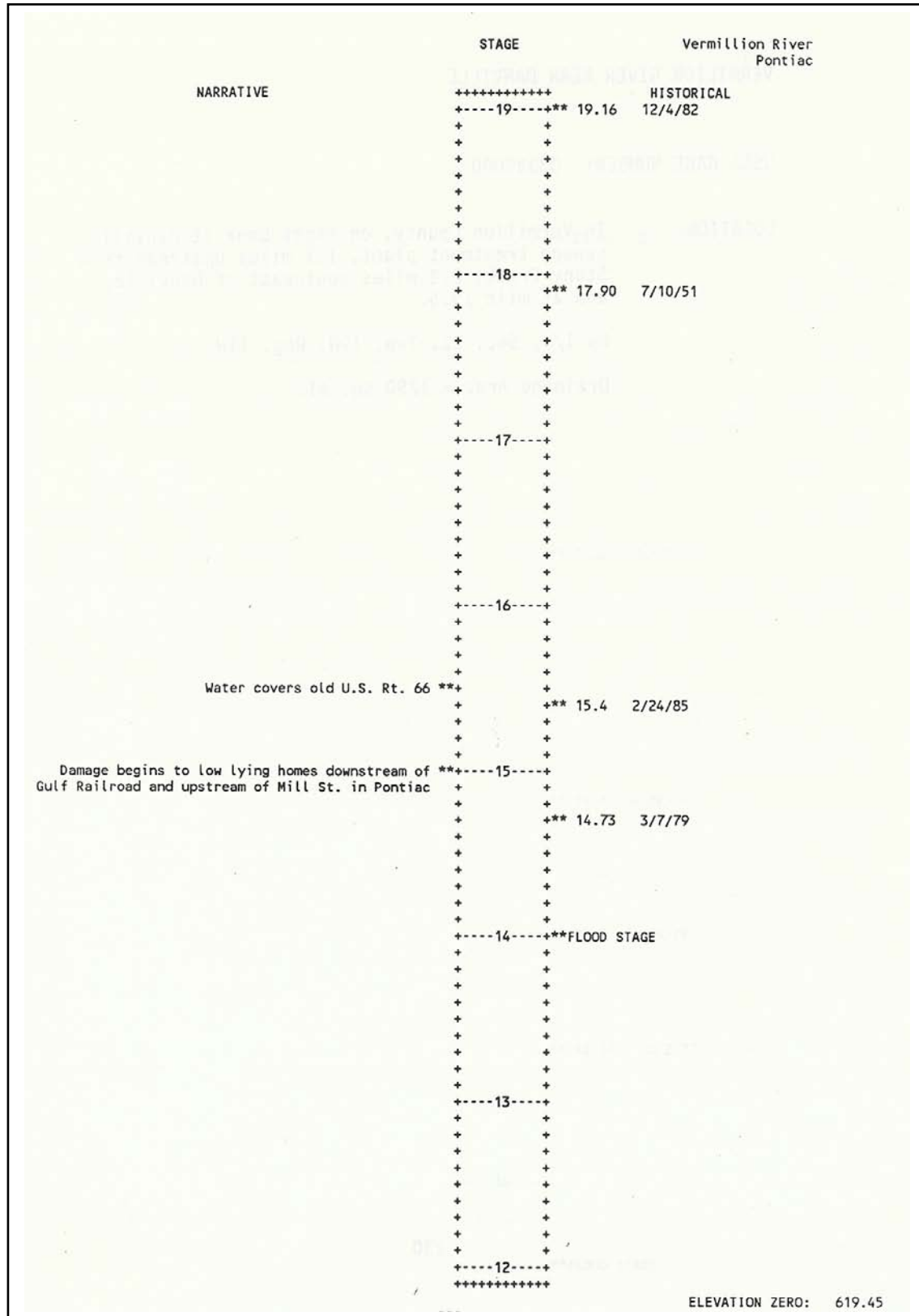
<http://dnr.state.il.us/owr/Surveillance.htm>

### 2.3.1.2 Safety, Health and Damage Considerations

**Safety:** A car will float in less than 2 feet of moving water and can be swept downstream into deeper waters. This is one reason floods kill more people trapped in vehicles than anywhere else (see table). The National Weather Service (NWS) sponsors a safety campaign of "Turn Around, Don't Drown." While Livingston County experiences relatively shallow flooding in floodplain areas, the hazard can still exist on flooded roadways and at underpasses and viaducts. The Center for Disease Control reports that flash flooding is the leading cause of weather-related deaths in the U.S. There are approximately 200 such deaths per year.

People die of heart attacks, especially from exertion during a flood fight. Electrocuting is a cause of flood deaths, claiming lives in flooded areas that carry a live current created when electrical components short out. Floods also can damage gas lines, floors, and stairs, creating secondary hazards such as gas leaks, unsafe structures, and fires. Fires are particularly damaging in areas made inaccessible to fire-fighting equipment by high water or flood-related road or bridge damage.

**Figure 2-1**  
**Vermilion River Stream Gage at Pontiac – Historic Information**



**Warning and Evacuation:** The threat to life posed by a flood can be avoided if people can evacuate before the waters reach their buildings or close their evacuation routes. This requires advance notice that a flood is coming and a system to disseminate flood warnings. For smaller, urban, streams, flood waters can rise so fast during a heavy local rain, that expensive systems of remote rain and stream gages would be needed to provide adequate notice to emergency managers. Even with those types of systems, there is often little time to reach high ground.

**Bridges:** A key evacuation and safety concern is when water goes over roads and bridges. Generally, the larger the road, the more likely it will not flood, but this is not always the case. Interstate highways have flooded in the Chicago metropolitan area. A bridge does not have to be under water to be damaged or to cut off an evacuation route. In some cases the bridge is high, but the access road may be flooded. In other cases, the bridge or culvert can be washed out. This is especially dangerous if a person drives on a flooded road and assumes that the bridge is still there.

**Health:** While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry pollutants from the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals.

Flood waters saturate the ground which leads to infiltration into sanitary sewer lines. When wastewater treatment facilities are flooded, there is often nowhere for the treated sewage to be discharged or inflowing sewage to be stored. Infiltration and lack of treatment lead to overloaded sewer lines which back up into low-lying areas and some homes. Even though diluted by flood waters, raw sewage can be a breeding ground for bacteria, such as *E. coli*, and other disease-causing agents. Because of this threat, tetanus shots are given to people affected by a flood.

The second type of health problem comes after the water is gone. Stagnant pools become breeding grounds for mosquitoes, and wet areas of a building that have not been cleaned breed mold and mildew. A building that is not thoroughly and properly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when heating ducts in a forced-air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants.

If the municipal water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and irreplaceable keepsakes destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

"These follow-up studies show a consistent pattern of increased psychological problems among flood victims for up to 5 years after the flood. The findings regarding non-psychiatric morbidity are less consistent, but many of the reported morbidity problems such as hypertension and cardiovascular disease and even leukemia and lymphoma may be stress related." – The Public Health Consequences of Disasters, page 74.

**Building Damage:** Deep or fast moving waters will push a building off its foundation. Structural damage can also be caused by the weight of standing water, known as "hydrostatic pressure."

Basement walls and floors are particularly susceptible to damage by hydrostatic pressure. Not only is the water acting on basement walls deeper, a basement is subjected to the combined weight of water and saturated earth. In addition, water in the ground underneath a flooded building will seek its own level, resulting in uplift forces that can break a concrete basement floor.

Another common type of damage inflicted by a flood is caused by soaking. When soaked, many materials change their composition or shape. Wet wood will swell and, if dried too quickly, will crack, split or warp. Plywood can come apart. Gypsum wallboard will fall apart if it is bumped before it dries out. The longer these materials are wet, the more moisture, sediment and pollutants they will absorb.

Soaking can cause extensive damage to household goods. Wooden furniture may become so badly warped that it cannot be used. Other furnishings such as upholstery, carpeting, mattresses, and books usually are not worth drying out and restoring. Electrical appliances and gasoline engines will not work safely until they are professionally dried and cleaned.

In short, while a building may look sound and unharmed after a flood, the waters can cause a lot of damage. To properly clean a flooded building, the walls and floors should be stripped, cleaned, and allowed to dry before being recovered. This can take weeks and is expensive.

**Past Events:** The NCDC began keeping consistent records of flood events for Livingston County in 1996. Review of gage records shows other flood events prior to 1996. Municipal records provide a picture of the flood event and a description of needed emergency action and resulting damages. Based on the NCDC, gage records and municipal data, Table 2-10 shows the known flood events for Livingston County.

**Table 2-10**  
**Livingston County Recorded Flood Events**

<b>Location:</b>	<b>Date:</b>	<b>Time:</b>	<b>Description:</b>
Countywide	10-Jun-1974		Declared disaster
Countywide	13-Dec-1982		Declared disaster
Dwight	11-Jun-1998	1:00 AM	
Countywide	6-Jul-1998	5:00 AM	
Reading Township & Pontiac	5-Jun-2001		
Countywide	12-May-2002		
Dwight	30-May-2004		
North Part of County	13-Jan-2005		Numerous rural roads were reported to be covered with water across the northern half of the county.
Chatsworth	16-Apr-2006		
Dwight	29-May-2006		
Chatsworth	11-Jul-2006	4:00 PM	
Reading Township	9-Sep-2006	4:30 AM	
Saunemin & Pontiac	23-Mar-2007		
Pontiac & Chatsworth	18-Jul-2007		
Countywide	8-Jan-2008		Declared disaster
Reading Township	13-Sep-2008		
Rooks Creek	27-Apr-2009		

### 2.3.2 Flood Vulnerability Analysis

Past and future flood impacts, in terms of people and costs, will be discussed in this section. Impacts being considered are summarized under four categories: damage to buildings, damage to critical facilities, health and safety, and economic impact (damage to businesses and infrastructure). All Livingston County communities are vulnerable to flooding due to the relatively flat topography and soils in the County. However the most recent and significant flooding was in the City of Pontiac, . Most all of the flooding that Livingston County has experienced has been a combination of stormwater and floodplain flooding.

**Damage to Buildings:** To examine the exposure of buildings to flooding, the County's GIS was used to estimate the number of parcels in the 100-year floodplain. From the number of parcels, an estimate was made of the number of buildings in the floodplain. Exhibit 2-3 shows the 100-year floodplain in Livingston County. Table 2-11 summarizes the number of land parcels located within the 100-year floodplain or touching the floodplain. The total floodplain area for Livingston County is 77.61 square miles, or 7.4 % of the County.

**Table 2-11**  
**Livingston County Land Parcels Located Within or Touching the 100-year Floodplain**

<b>Livingston County</b>	<b>Area (Acres)</b>	<b>Area (Square Miles)</b>
Zone A - 100-year Approximate Study Areas	48,461	75.72
Zone AE – 100-year Detailed Study Areas*	1,190	1.89
Total:	49,651	77.61

From a GIS analysis of Livingston County parcel data and the FEMA DFIRM information, it was determined that there are a total of 4,348 parcels that are within or *touch* the 100-year floodplain. The majority of the floodplain parcels are farm parcels. Given the size of the County and the resolution of the aerial mapping, the number of homes in the floodplain (homes verses farm buildings for parcels within the floodplain, and any structure within the floodplain for parcels that touch the floodplain) could not readily be determined. There is a concentration of floodplain parcels (and homes) within the City of Pontiac and Village of Dwight. Using the flood insurance policy data in Table 2-13, and the FEMA estimate that one in four properties in the floodplain carries flood insurance, then the estimate of Livingston County homes in the floodplain is around 1,400. GIS determined that there are at least five critical facilities within the floodplain.

In Table 2-12, the floodplain homes estimate of 1,400 was used along with the structure values taken from Table 2-7. For residential structures, contents are valued at 50% of the building's value. Non-residential buildings in the floodplain were not estimated, but the value for non-residential structures in Table 2-7 was used for the value of critical facilities, along with a contents estimate of 100%.

The figure of \$100.5 million is a conservative estimate of Livingston County property vulnerable or exposed to flood damage in the 100-year floodplain. The full exposure of Livingston County to 100-year flood damages includes the damages to structures outside the 100-year floodplain, transportation losses, recreation and environmental losses, and the cost of response and recovery. The main concentration of homes in the floodplain are in the City of Pontiac and the Village of Dwight.



**Table 2-12**  
**Estimate of Livingston County Flood Vulnerability**

Building:	Number of Buildings:	Estimate of Structure Value:	Estimate of Contents	Estimate of 100-year Flood Floodplain Exposure:
Residential	1,400	\$47,100	\$23,550	\$98.9 million
Critical Facilities	5	\$158,300	\$158,300	\$1.6 million
Total	1,405			\$100.5 million

**Examination of flood insurance claims:** Another source of damage data is past claims paid by the National Flood Insurance Program. Table 2-13 summarizes flood insurance claims in Livingston County. There are currently over 467 active flood insurance policies in Livingston County. It is not known how many of those policies are for floodplain properties (flood insurance is available for any property in a community participating in the NFIP). 278 flood insurance claims have been made since 1979 for a total approaching \$1.9 million. Table 2-13 shows that average claim paid to be \$6,723.

Flood insurance claims figures do not include items not covered by a flood insurance policy, such as landscaping, automobiles, and the value of lost family heirlooms. They also do not include damage to uninsured or underinsured properties. Also FEMA often uses the estimate that only one in four homes in the floodplain is covered by flood insurance. If this is true, then past flood damage in Livingston County (from 1978 to 2010) would exceed \$74 million.

**Table 2-13**  
**Livingston County Flood Insurance Claims (1978 to 2010) Summary**

Community	Number of Claims	Total Paid	Number of Active Policies	Total Premium	Total Coverage
Dwight	15	\$ 28,527	49	\$ 30,133	\$ 5,610,900
Fairbury	2	\$ 6,378	1	\$ 1,210	\$ 183,400
Forrest	1	\$ 7,935	12	\$ 4,294	\$ 1,034,200
Unincorp. Livingston County	7	\$113,661	60	\$ 33,490	\$ 5,472,300
Pontiac	239	\$1,693,065	323	\$ 186,567	\$ 24,511,600
Streator*	14	\$19,317	22	\$ 11,451	\$ 1,364,800
<b>Total:</b>	<b>278</b>	<b>\$1,868,883</b>	<b>467</b>	<b>\$ 267,145</b>	<b>\$ 38,177,200</b>

\* Includes Streator in Livingston and LaSalle Counties

Source: FEMA, February 2010

**Repetitive Losses:** There are several different definitions of a "repetitive loss property." This Plan uses FEMA's Community Rating System definition, in part because data is readily available: "A repetitive loss property is one which has received two flood insurance claim payments for at least \$1,000 each since 1978." These properties are important to the National Flood Insurance Program and the Community Rating System because even though they comprise 2% of the policy base, they account for 33% of the country's flood insurance claim payments.

There are eight repetitive loss structures on FEMA's repetitive loss list for Livingston County. All eight properties are located within the City of Pontiac within the same general neighborhood. The structures are all single family homes. Only two of the homes currently carry flood insurance. Both of the insured homes had flood insurance claims in 2008 in amounts in excess of \$20,000 for structure and contents. Therefore it is reasonable to surmise that all eight repetitive loss properties in Pontiac received flooding in 2008. Insurance claims from all eight properties in 1980 and 1982 floods averaged \$3,000 per home.

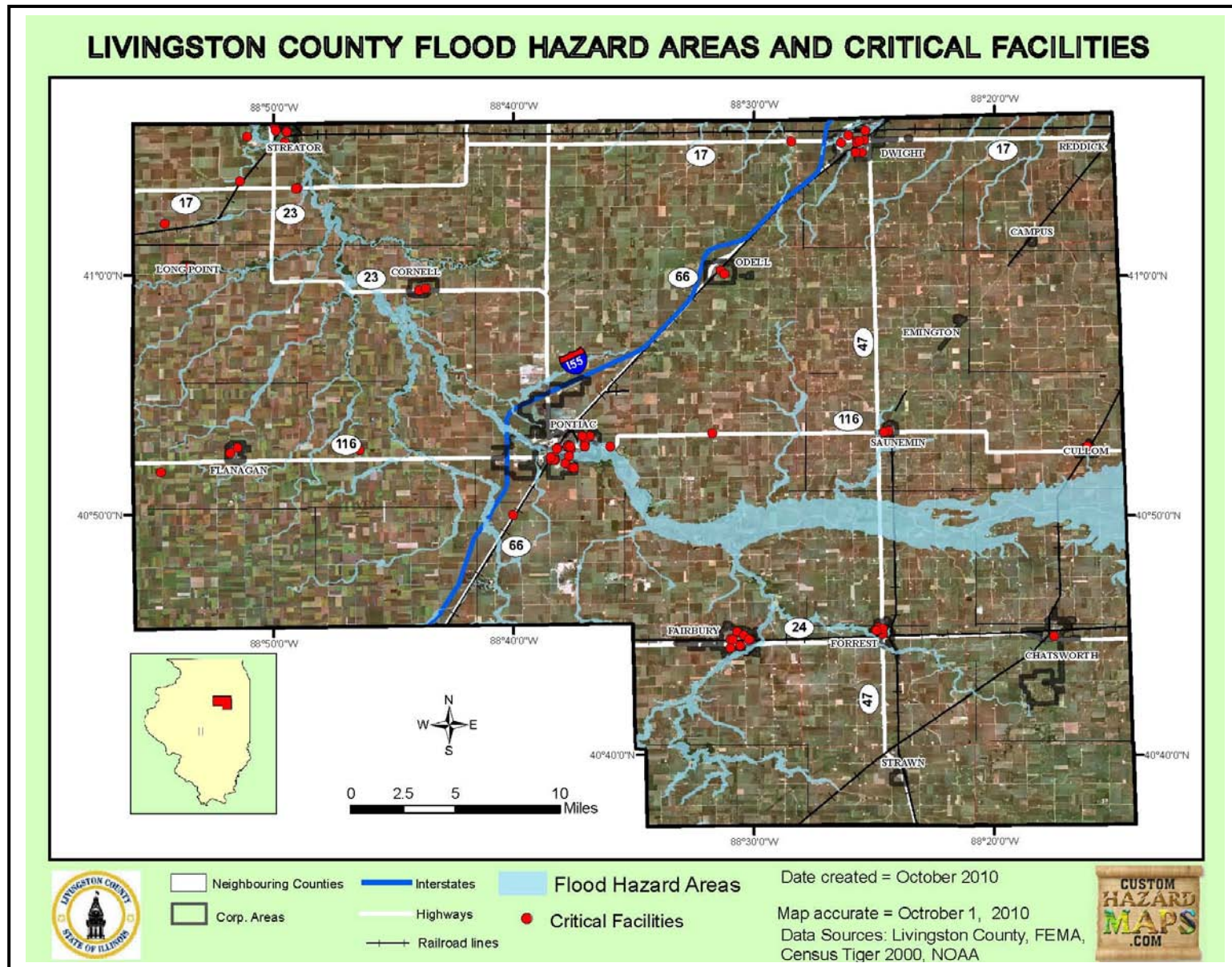


Exhibit 2-3 Livingston County 100-year Floodplains and Critical Facilities

**Critical Facilities:** Five critical facilities appear to be in the floodplain. This estimate does not include wastewater treatment facilities. As the County's GIS is expanded, a more accurate analysis of critical facilities in the floodplain will be developed.

**Transportation:** The FEMA FIS provides limited flood profiles for Livingston County, so at this time the impact of Vermillion River flooding to Interstate 55, west of Pontiac cannot be determined. From the floodplain mapping (see Exhibit 2-3), it appears that Illinois State Route 47, south of Saunemin, is overtopped during a 100-year flood.

**Health and safety:** The flooding experienced in Livingston County shows that the safety and lives of people are of concern during flood events. Past flood events show that flood warning and flood preparedness are important. One death, due to electrocution, has been attributed to the flooding that occurred in 2008. The impact to health and safety is moderate during flood events.

**Economic Impact:** Flood damage to businesses is difficult to estimate. Businesses that are disrupted by floods often have to be closed. They lose their inventories, customers cannot reach them, and employees are often busy protecting or cleaning up their flooded homes. Business can be disrupted regardless of the business being located in the floodplain when customers and clients cannot reach their location.

A number of businesses around the County, and especially in Pontiac, are impacted when there is flooding, but there is insufficient data to determine a dollar impact. Overall economic impact to businesses is moderate.

**Budget impact:** As with flooded roads, public expenditures on flood fighting, sandbags, fire department calls, clean-up and repairs to damaged public property affect all residents of the County, not just those in the floodplain.

## 2.4 Severe Summer Storms

In this Plan, severe storms are considered to be thunderstorms, microbursts or high wind events, lightning events, and hail storms.

### 2.4.1 Severe Summer Storm Hazard Assessment

Thunderstorms are most likely to happen in the spring and summer months and during the afternoon and evening hours, but can occur year-round and at all hours. The biggest threats from thunderstorms are flash flooding and lightning. In most cases, flash flooding occurs in small drainage areas where water quickly accumulates before it drains to floodplains.

The NWS classifies a thunderstorm as severe if its winds reach or exceed 58 mph, produces a tornado, or drops surface hail at least 0.75 inch in diameter. Compared with other atmospheric hazards such as tropical cyclones and winter low pressure systems, individual thunderstorms affect relatively small geographic areas. The average thunderstorm system is approximately 15 miles in diameter (75 square miles) and typically lasts less than 30 minutes at a single location. However, weather monitoring reports indicate that coherent thunderstorm systems can travel intact for distances in excess of 600 miles.

Other threats from thunderstorms include downburst winds, high winds, hail and tornadoes. Downdraft winds occur during the dissipating stage of all thunderstorms. Downburst winds are strong, concentrated, straight-line winds created by falling rain and sinking air that can reach speeds of 125 mph and are often associated with intense thunderstorms. Downbursts may produce damaging winds at the surface.

Lightning, which occurs during all thunderstorms, can strike anywhere. Generated by the buildup of charged ions in a thundercloud, the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. The air in the channel of a lightning strike reaches temperatures higher than 50,000°F. The rapid heating and cooling of the air near the channel causes a shock wave which produces thunder.

When lightning strikes a human being, death, or at a minimum, serious burns are the common outcomes. For every person killed by lightning, three people are injured. For those who survive, their injuries can lead to permanent disabilities. Seventy percent of the survivors suffer serious, long-term effects, such as memory loss, sleep disorders, depression, and fatigue.

Microbursts can form from intense thunderstorms. A microburst is a convective downdraft with an affected outflow area of less than 2½ miles wide and peak winds lasting less than 5 minutes. Microbursts may induce dangerous horizontal or vertical wind shears, which can cause property damage (and adversely affect aircraft performance).

Hailstones are ice crystals that form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. The size of hailstones is a direct function of the severity and size of the storm. Significant damage does not result until the stones reach 1.5 inches in diameter, which occurs in less than half of all hailstorms.

**Safety:** The threat to life and the cause of death vary by the type of storm. Between 1995 and 2000, the NWS reported 20 people in Illinois were killed by flash floods, wind, and lightning brought by thunderstorms.

Hail rarely causes loss of life. Most deaths can be prevented through safe practices. Much information has come out over the last 20 years about lightning safety, for example, which has reduced the loss of life. Before 1990, an average of 89 people were killed by lightning each year.

**Health:** No special health problems are attributable to thunderstorms, other than the potential for tetanus and other diseases that arise from injuries and damaged property.

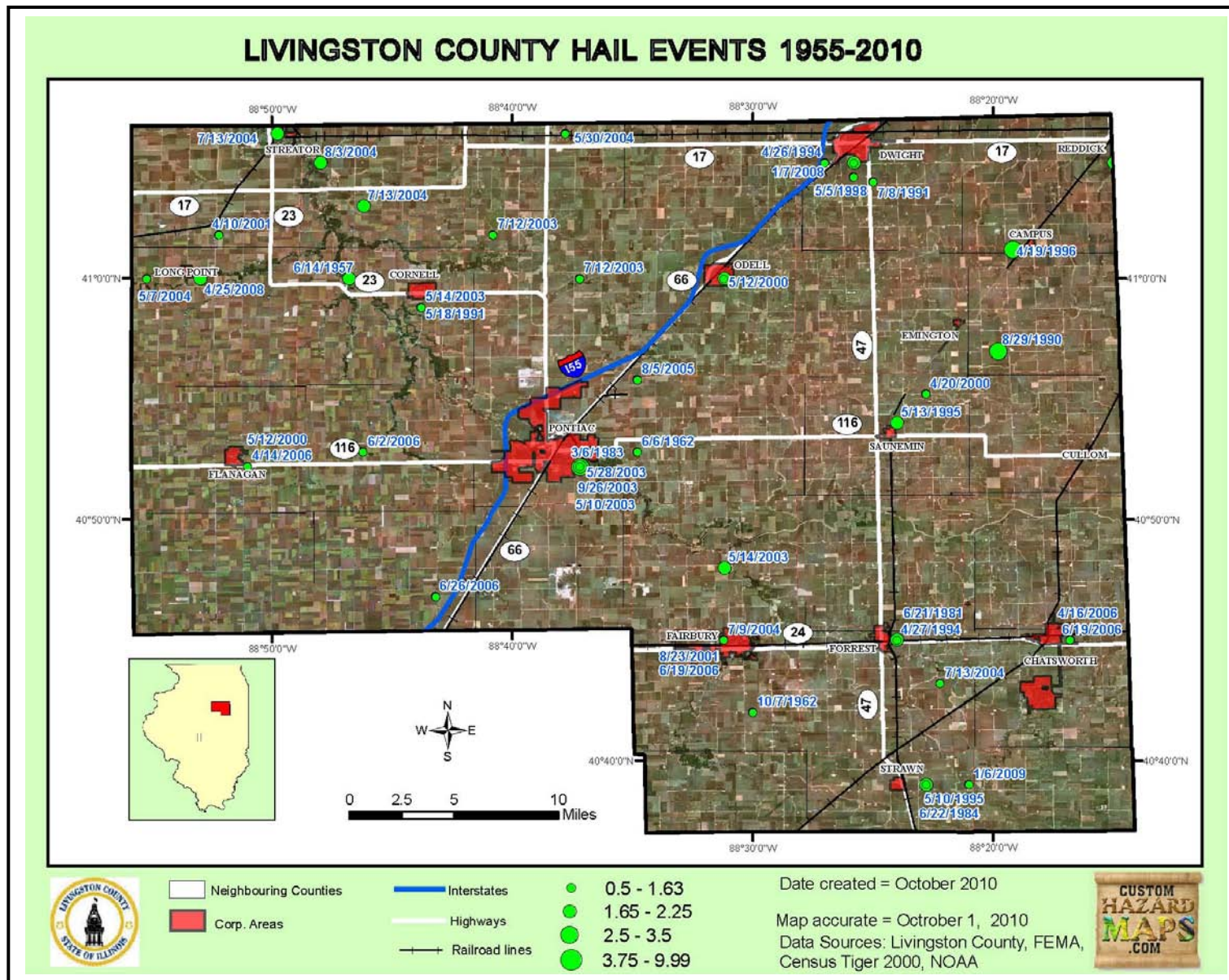
**Past Events - Hail:** There have been 55 hail events recorded in the NCDC from 1957 to 2010 in Livingston County, and ranging in size from 0.75 inches to 3.0 inches. Exhibit 2-4 shows the location of all recorded hail events. Table 2-14 shows hail events for hail greater than 1.0 inches in size. In April 1996, 3-inch hailstones (teacup size) fell near Campus. No injuries, deaths or damage were reported with the events.

**Past Events – Thunderstorm and Wind:** Exhibit 2-5 shows the recorded thunderstorm and strong wind events for Livingston County. 102 events have been recorded in the NCDC since 1958. The storms have not been provided in a table. The NCDC database does not show any record of injuries, but one death in a May 24, 2006, event in Pontiac. Damage estimate reported since 2006 total \$223,000.

**Table 2-14**  
**Livingston County Hail Event Details**  
Larger than 1.0 inch in size

Date:	Time:	Size:	Location:
6/14/1957	2:25 PM	1.75 in.	County
6/20/1981	8:00 PM	2.00 in.	County
6/22/1984	5:10 PM	1.75 in.	County
8/29/1990	5:35 PM	2.75 in.	County
5/13/1995	9:25 AM	1.75 in.	Saunemin
4/19/1996	4:25 PM	1.75 in.	Pontiac
4/19/1996	4:58 PM	1.75 in.	Reddick
4/19/1996	5:03 PM	3.00 in.	Campus
5/19/1998	2:40 PM	1.75 in.	Odell
5/9/2003	8:30 PM	2.50 in.	Pontiac
5/14/2003	4:13 PM	1.75 in.	Fairbury
5/20/2004	10:05 PM	1.75 in.	Dwight
7/13/2004	1:09 PM	1.75 in.	Manville
7/13/2004	1:20 PM	2.00 in.	Manville
4/25/2008	15:24 PM	1.75 in.	Long Point





National Weather Service's Hail Description

Description	Diameter (inches)
Pea	0.25
Marble or Mothball	0.50
Penny or Dime	0.75
Nickel	0.88
Quarter	1.00
Half Dollar	1.25
Walnut or Ping Pong Ball	1.50
Golfball	1.75
Hen's Egg	2.00
Tennis Ball	2.50
Baseball	2.75
Tea Cup	3.00
Grapefruit	4.00
Softball	4.50

Exhibit 2-4 Livingston County Recorded Hail Events



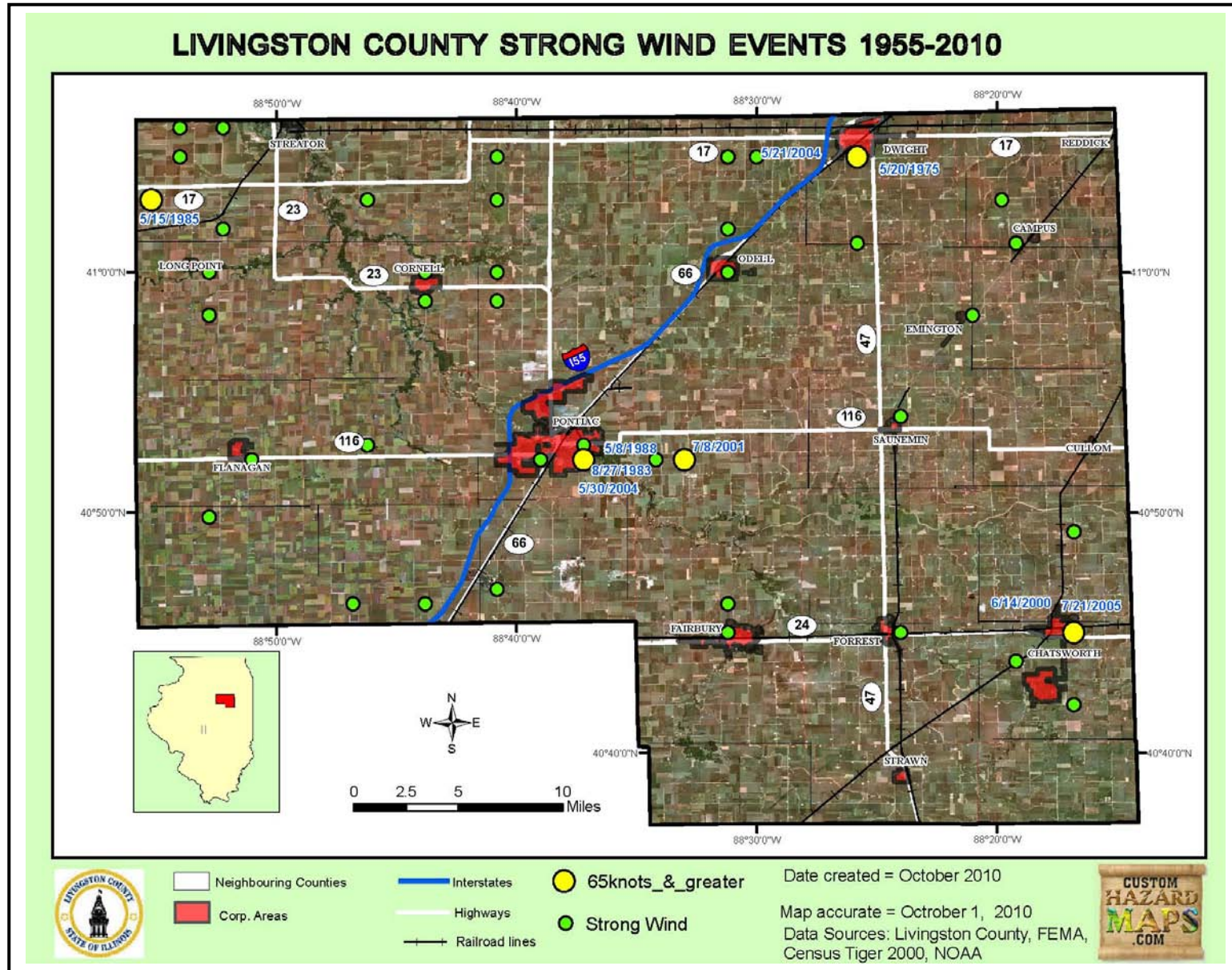


Exhibit 2-5 Livingston County Recorded Wind Events

**Table 2-15**  
**Livingston County Frequency of Severe Summer Storms**

Year	Number of Storms	Magnitude
1996	3	56 mph
1997	3	50-52 mph
1998	1	50mph
1999	2	50 mph
2000	6	50-40 mph
2001	3	55-61 mph
2002	1	50 mph
2003	4	50-57 mph
2004	4	50-55 mph
2005	3	50-55 mph
2006	8	50-57 mph
2007	1	60 mph
2008	7	55-60 mph
2009	5	52-61 mph

**Frequency:** Table 2-15 shows the frequency of recorded severe summer storms for Livingston County. The Livingston County area averages 3.6 thunderstorm events each year with winds in excess of 50 miles per hour. They average an hour in duration. It is estimated that an average of 3 storms each year have the hailstorms and high winds to be considered a severe thunderstorm. Assuming the average severe storm affects 100 square miles, the odds of a severe thunderstorm hitting any particular square mile in Livingston County are 1 in 3 or 33 %.

## 2.4.2 Severe Summer Storms Vulnerability Assessment

**Damage to Buildings:** As with tornadoes, mobile homes are at a high risk for damage from thunderstorms. Wind and water damage can result when windows are broken by flying debris or hail. Lightning can cause direct damage to structures (especially those without lightning protection systems) and can cause fires that damage forests and structures.

Hail can inflict severe damage to roofs, windows and siding, depending on hailstone size and winds. One study of insured losses in St. Louis found that 75 % of the dollar damage was to roofing, 12 % to awnings, 6 % to exterior paint, 4 % to glass and 3 % to siding (Hail Loss Potential in the US, page 2).

If a severe summer storm impacts a 100 square mile area of the County, then approximately a tenth of the County would be affected (Livingston County area equals 1,045 square miles). If 1 % of the homes in that area were subject to damage, the vulnerability of Livingston County buildings would be:

$$(100 \text{ square miles} \times 14.3 \text{ housing units per square mile} \times \$64,600 \text{ per home}) \times 1\% =$$

$$= \$923,780 \text{ in building value exposed}$$

If a severe storm impacted Pontiac (with a land area of 5.25 square miles) with a housing density of 833 homes per square mile (average value of house structure is \$47,100), then the vulnerability of Pontiac buildings would be:

$$(5.25 \text{ square miles} \times 833 \text{ housing units per square mile} \times \$47,100 \text{ per home}) \times 1\% =$$

$$= \$2,059,800 \text{ in building value exposed}$$

Impact to buildings is considered moderate.

**Damage to Critical Facilities:** Critical facilities are susceptible to the same damage and disruption from thunderstorms as other buildings. Emergency operations can be disrupted as thunderstorms and lightning affect radio communications and antennas are a prime target for lightning. To date, there is no record of critical County facilities having incurred any damages due to severe storms. Damage to critical facilities is considered moderate.

**Health and Safety:** Severe summer storms pose a real danger to people's lives. With thunderstorms, high winds, lightning and hail, there is a large risk of injury and death. Impact to health and safety is considered moderate.

**Economic Impact:** Thunderstorms can impact transportation and utilities. Airplanes have crashed when hit by downbursts or lightning. Automobiles and their windshields are subject to damage by hail. Power lines can be knocked out by lightning or knocked down by wind and debris. Lightning can also cause power surges that damage appliances, electronic equipment and computers. Cost of clean-up by towns can be extensive.

Economic impact is considered moderate.

## 2.5 Winter Storms and Extreme Cold

### 2.5.1 Winter Storm and Extreme Cold Hazard Assessment

The Illinois Emergency Management Agency (IEMA) defines a severe winter storm as a storm that meets one or more of the following criteria:

- A snowstorm that produces six inches or more of snow within 48 hours or less,
- An ice storm in which 10 % of the cooperative NWS stations in Illinois report glaze, and/or
- A snowstorm or ice storm in which deaths, injuries, or property damage occurs.

There are many ways for winter storms to form, but certain key ingredients are needed. First temperatures must be below freezing in the clouds and near the ground. There must be a source of moisture in the form of evaporating water. Then lift in the atmosphere causes the moisture to rise and form clouds of precipitation.

Winter storms in the Midwest are caused by Canadian and Arctic cold fronts that push snow and ice deep into the interior region of the United States. Livingston County is also subject to lake effect snowstorms that develop from the passage of cold air over the relatively warm surface of Lake Michigan which can cause heavy snowfall and blizzard conditions.

Winter storms can occur as heavy snowfalls, ice storms or extreme cold temperatures. Winter storms can occur as a single event or they can occur in combination which can make an event more severe. For example, a moderate snowfall could create severe conditions if it were followed by freezing rain and subsequent extremely cold temperatures. The aftermath of a winter storm can impact a community or region for weeks, and even months.

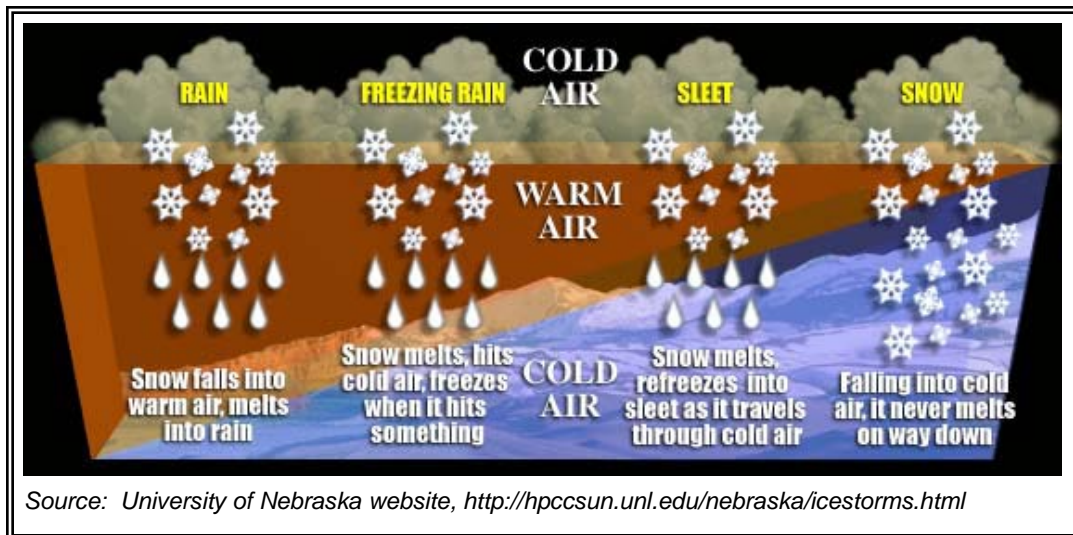
**Snow:** Heavy snowfalls can range from large accumulations of snow over many hours to blizzard conditions with blowing snow that could last several days. The NWS's snow classifications are shown on the following page. Figure 2-2 shows the expected average snowfall for Illinois.



Snow Classifications	
Blizzard	Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than ¼ mile for at least 3 hours.
Blowing Snow	Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
Snow Squalls	Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
Snow Showers	Snow falling at varying intensities for brief periods of time. Some accumulation possible.
Snow Flurries	Light snow falling for short duration with little or no accumulation.
Source: NWS	

**Ice Storms:** An ice storm occurs when freezing rain falls from clouds and freezes immediately upon impact. Freezing rain is found in between sleet and rain. It occurs when the precipitation falls into a large layer of warm air and does not have time to refreeze in a cold layer (near or below 32°F) before it comes in contact with the surface, which is also near or below 32°F, as illustrated below.

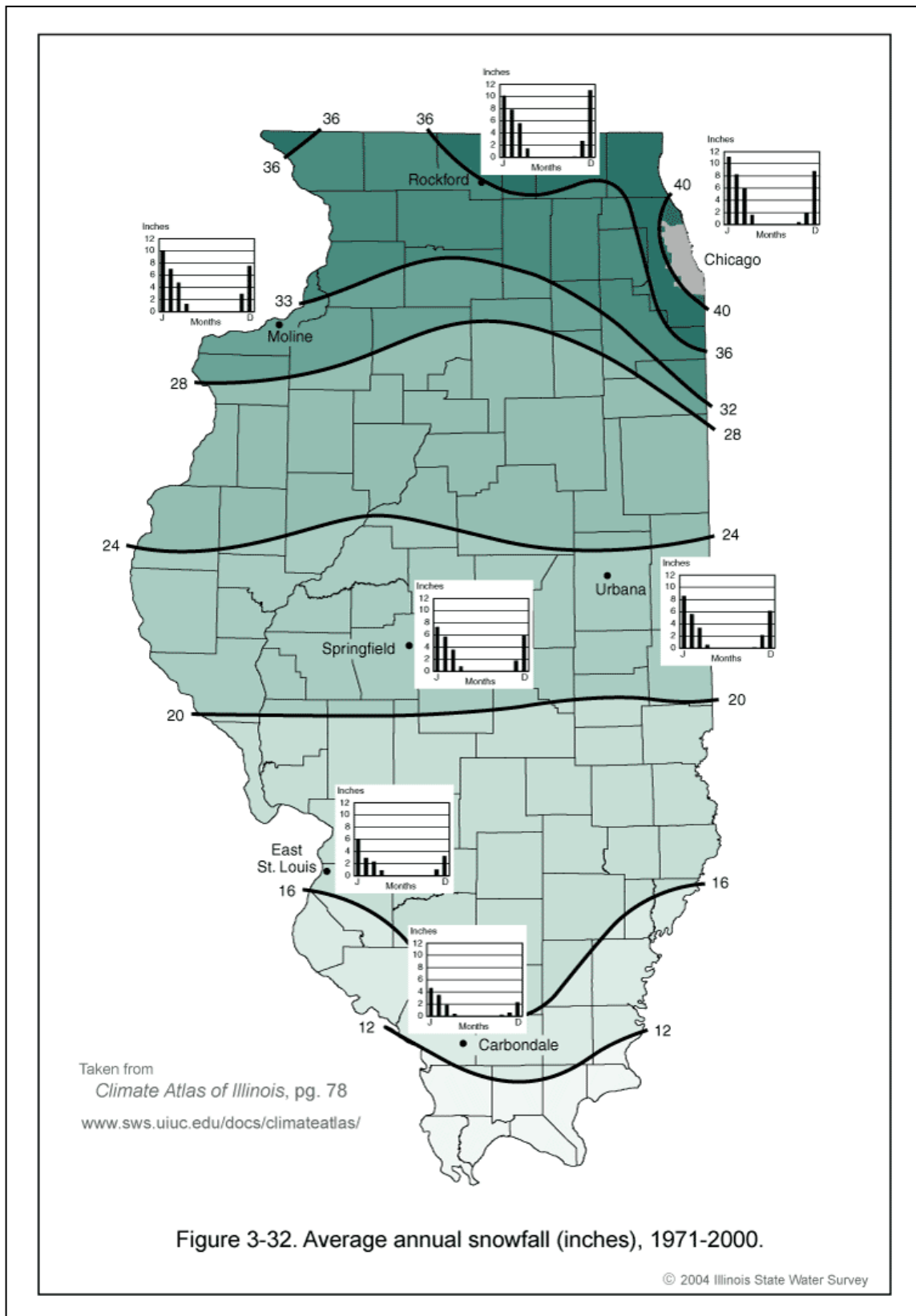
**Past Events:** The average annual snowfall for Livingston County is 36 inches. Saunemin recalls being impacted by a significant ice storm in December 1966. The NCDC began tracking significant winter storm events in 1995. The January 1999 and December 2000 winter storm events were declared federal disasters. The recorded snowfall amounts for the January 1999 event were 17 inches in Chatsworth and 13 inches in Fairbury. The



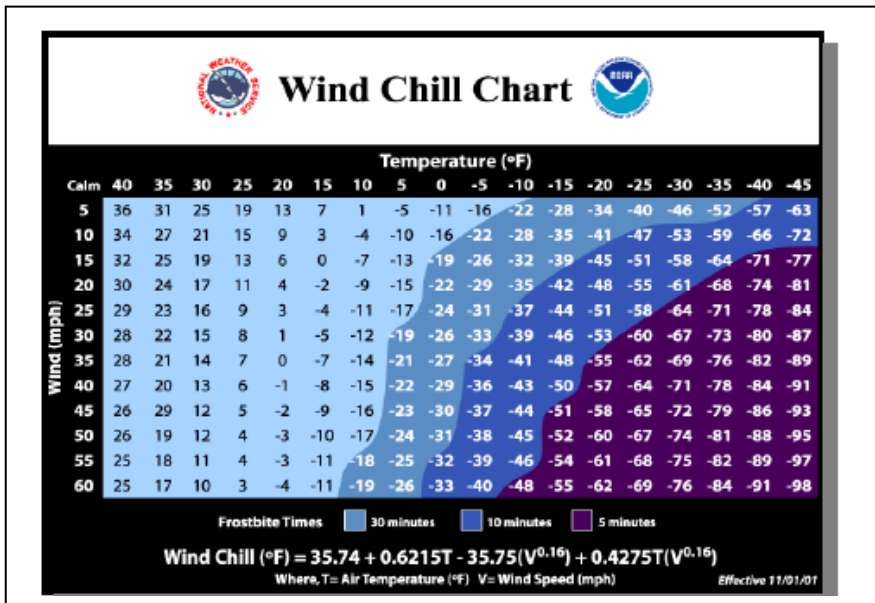
recorded snowfall amounts for December 2000 were 9.1 inches in Chatsworth, 11 inches in Dwight, and 6 inches in Streator. No deaths or injuries were reported in Livingston County, but in January 1997 there were 5 deaths in Cook County and one unidentified death in January 1999.

**Frequency:** The NCDC record shows a winter storm event for Livingston County for every year since 1995 except for 1996, 2001 and 2004. Most years show more than one event, therefore, the odds of a winter storm hitting Livingston County in any given year are 1:1 or a 100 % chance, with the entire County being impacted.

Figure 2-2  
Illinois Average Snowfall



**Extreme cold:** The term "extreme cold" can have varying definitions in hazard identification. Generally, extreme cold events refer to a prolonged period of time (days) with extremely cold temperatures. An extreme cold event to the National Weather Service can refer to a single day of extreme or record-breaking day of sub-zero temperatures. Extended or single day extreme cold events can be hazardous to people and animals, and cause problems with buildings and transportation.



The effect of cold on people is usually made more severe by the impact of wind chill factors. Wind chill is reported as a temperature, but is not the actual temperature. Rather it is how wind and cold feel on exposed skin. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature. The chart on page 2-8 shows the conversion of outside air temperatures to wind chill temperatures.

Winter chill advisories are issued by the NWS when wind chill temperatures are between -20 and -29 degrees Fahrenheit and winds are greater than 10 miles per hour. When wind chill temperatures are -30 degrees and lower, with winds greater than 10 miles per hour, a wind chill warning is issued.

**Damage:** Damage to structures due to extreme cold events is relatively low. Freezing pipes can be the largest problem. Broken water mains can put significant demands on municipal public works departments.

**Historical events:** Four extreme cold temperature events have been recorded for Livingston County since 1996: February 1996, followed by January of 2003, 2004 and 2009.

**Probability of future occurrences:** From the recent recorded occurrences, with consideration of their severity, the probability of occurrence is estimated to be once every 5 years, or a 20 percent chance in any given year.

## 2.5.2 Vulnerability Assessment – Winter Storms

**Damage to Buildings:** Historically, roofs would collapse due to heavy snow loads, but most buildings are now constructed with low temperatures, snow loads and ice storms in mind. With today's energy consciousness, buildings are much better insulated than they were 50 years ago. Winter storms do not have a major impact on buildings. Impact on critical facilities is low.

**Critical Facilities:** The major impacts of snow and ice storms on property are to utilities and roads. Power lines and tree limbs are coated with heavy ice resulting in disrupted power and telephone service, often for days. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians. Bridges and overpasses become particularly dangerous because they freeze before other surfaces. Impact on critical facilities is low.

**Health and Safety:** Winter storms bring the following two types of safety hazards:

- Weather-related hazards, including hazardous driving and walking conditions and heart attacks from shoveling snow.
- Extreme cold, from the low temperatures, wind chill, and loss of heat due to power outages.

#### **Injuries Related to Cold**

- 50 % happen to people over 60 years old
- More than 75 % happen to males
- About 20 % happen at home

In the United States, the number of deaths peaks in midwinter and reaches a low point in late summer, but most deaths are not directly related to the weather. The table to the right shows that winter storms have led to more deaths in Illinois than any other natural hazard. Certain populations are especially vulnerable to the cold, including the elderly, the homeless, and lower income families with heating problems.

About 70 % of the injuries caused by snow and ice storms result from vehicle accidents and 25 % occur to people caught out in the storm. Crash statistics from the Illinois Department of Transportation for the five year period from 2004 through 2008 have been evaluated to determine the number of accidents that occur. The results in Table 2-16 suggest that winter driving conditions should be taken seriously.

**Table 2-16**  
**Vehicle Crashes During Winter**

Year	Road Conditions		Injuries	Deaths
	Ice	Snow/Slush		
2008	371	1,124	307	4
2007	259	915	288	6
2006	93	292	76	3
2005	177	611	141	1
2004	171	486	152	2
<b>Total</b>	1,071	4,392	964	16

Source: IDOT

While most injuries caused by snow and ice storms result from vehicle accidents, about 25 percent of all winter storm injuries occur to people caught outside in a storm. The effect of cold on people is magnified by wind. As the wind increases, heat is carried away from the body at an accelerated rate, driving down body temperature. Frostbite (damage to tissue) to hands, feet, ears, and nose, and hypothermia (lowering of body temperature below 95 F) are common winter storm injuries.

The effect of cold on people is usually made more severe by the impact of wind chill effect. Wind chill is reported as a temperature, but is not the actual temperature. Rather it is how wind and cold feel on exposed skin. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature.

Extreme cold can result in people and animals suffering from frostbite and hypothermia. Frostbite is damage to tissue caused by the effects of ice crystals in frozen tissue. Extremities (hands, feet, ears, and nose) with more circulation difficulties are most frequently affected.

Hypothermia is the lowering of the core body temperature. It is "clinically significant" when the body temperature is below 95°F. Severe hypothermia occurs when the body's temperature drops below 85°F, resulting in unconsciousness. If help does not come, death follows. Great care is needed to properly re-warm a person, even mild cases.

Health and safety impact is moderate.

**Economic Impact:** Loss of power means businesses and manufacturing concerns must close down. Loss of access due to snow or ice covered roads has a similar effect. There are also impacts when people cannot get to work, to school, or to the store.

**Budget impact:** As shown by the funds spent by the County and municipalities, the cost of snow removal for a winter storm event can be significant. For the January 1999 snow event, the \$187,000 spent by Livingston County Highway Division was the amount spent above their budgeted amount for snow events, which is about \$50,000.

Economic impact is moderate.

## 2.6 Tornado

### 2.6.1 Tornado Hazard Assessment

Tornadoes are one of nature's most violent storms. A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of one mile wide and 50 miles long. A majority of tornadoes, however, have wind speeds of 112 mph or less. The box below provides the newly adopted "Enhanced Fujita (EF) Scale" for evaluating tornado magnitude scale. The EF Scale replaces the Fujita Tornado Scale, used to categorized tornado events. A tornado isn't classified until the damaged area is inspected to determine the level of damage. The EF Scale provides for guidance for assessing various types of damage.

Debris hurled by the wind can hit with enough force to penetrate walls. Tornadoes create localized low-pressure areas that can make a building explode. Windows, chimneys and roofs are the most vulnerable parts of buildings to tornado damage.

Tornadoes can move forward at up to 70 miles per hour, pause, slow down and change directions. Most have a narrow path, less than 100 yards wide and several miles long. However, damage paths can be more than 1 mile wide and 50 miles long.

Tornadoes come in all shapes and sizes and can occur anywhere in the U.S. at any time of the year. In the southern states, peak tornado season is March through May, while peak months in the northern states are during the summer months.

Enhanced Fujita Scale				
Enhanced Fujita Scale*			Original Fujita Scale	
	Derived EF Scale	Operational EF Scale		
Enhanced Fujita Scale	3 Second Gust (mph)	3 Second Gust (mph)	Fujita Scale	3 Second Gust (mph)
EF0	65 - 85	65 - 85	F0	45 - 78
EF1	86 - 109	86 - 110	F1	79 - 117
EF2	110 - 137	111 - 135	F2	118 - 161
EF3	138 - 167	136 - 165	F3	162 - 209
EF4	168 - 199	166 - 200	F4	210 - 261
EF5	200 - 234	>200	F5	262 - 317

\* Effective February 1, 2007

In an average year, about 1,000 tornadoes are reported across the United States. Since 1995, deaths due to tornadoes are about 55 per year. Illinois is tied for 7th in the United States with an average of 26 tornadoes per year. A tornado can occur any time of year and at any time of day, though

statistics show that over half strike between 3:00 p.m. and 7:00 p.m.

**Health and Safety:** One death has been directly related to the June 5, 2010 tornado in Dwight. The August 1990 twister in Plainfield, Illinois, caused 28 deaths. The Utica, Illinois, tornado of 2004 killed eight people in one location.

The major health hazard from tornadoes is physical injury from flying debris or being in a collapsed building or mobile home. Based on national statistics for 1970 – 1980, for every person killed by a tornado, 25 people were injured and 1,000 people received some sort of emergency care. The August 1990 twister in Plainfield, Illinois, injured 350 people.

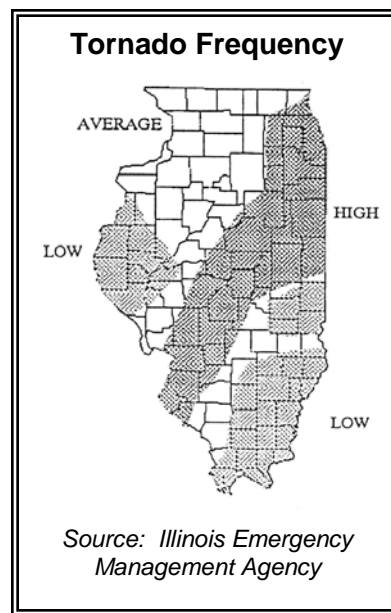
Within a building, flying debris or missiles are generally stopped by interior walls. However, if a building has no partitions, any glass, brick or other debris blown into the interior is life threatening. Following a tornado, damaged buildings are a potential health hazard due to instability, electrical system damage, and gas leaks. Sewage and water lines may also be damaged.

**Past Events:** Table 2-17 shows the recorded tornado events for Livingston County from 1950 to 2010, as recorded by the NCDC. The database includes 38 tornadoes. Exhibit 2-6 shows the tracks of the tornadoes, where the information is available.

**Frequency:** For Livingston County tornadoes appear to occur March through September. There doesn't appear to be a prominent month of tornado activity, until around 2000 when the majority of tornadoes occurred in May and June. Peak months in the northern states are typically during the summer.

In the 2007 Illinois Natural Hazard Mitigation Plan, Livingston County is classified as having an "elevated" tornado risk based on historic tornado wind speeds and the number of recorded tornadoes per 1,000 square miles.

Although there are no official recurrence intervals calculated for tornadoes, with 38 occurrences over 53 years (1957 to 2010), the likelihood of a tornado hitting somewhere in the County is 0.72 , or rounding to a 70% chance in any given year. The width and the length of a tornado's path can vary greatly, but with an assumption that a tornado affects one square mile of land, and there are 1045 square miles in Livingston County, the odds of a tornado hitting any particular square mile in the County is 1 in 1,500 each year, or a 0.07% chance.



**Table 2-17**  
**Livingston County Recorded Tornadoes**

Date	Time	Magnitude	Near	Deaths	Injuries	Property Damage, \$
1886			Odell			
7/16/1950	10:15 PM	F1	County	0	0	25K
4/7/1954	3:00 PM	F3	County	0	0	250K
3/14/1957	4:20 PM	F1	County	0	0	25K
6/8/1958	7:00 PM	F1	County	0	0	0K
9/30/1961	1:55 PM	F0	County	0	0	3K
4/24/1965	3:00 AM	F1	County	0	0	25K
9/4/1969	6:30 PM	F1	County	0	0	25K
11/1/1971	11:00 PM	F1	County	0	0	25K
6/25/1978	1:08 PM	F2	County	0	0	250K
8/19/1979	3:45 PM	F0	County	0	0	0K
6/7/1980	2:00 PM	F2	County	0	0	2.5M
4/2/1982	11:15 PM	F0	County	0	0	250K
4/2/1982	11:18 PM	F1	County	0	0	250K
9/29/1986	4:46 PM	F2	County	0	0	2.5M
6/26/1995	3:30 PM	F1	Blackstone	0	0	85K
5/18/2000	4:35 PM	F0	Blackstone	0	0	0
5/18/2000	4:50 PM	F0	Odell	0	0	0
5/18/2000	5:00 PM	F0	Fairbury	0	0	0
5/18/2000	5:45 PM	F0	Chatsworth	0	0	0
5/31/2000	2:05 PM	F0	Cullom	0	0	0
6/4/2002	1:54 PM	F0	Ancona	0	0	0
6/4/2002	2:16 PM	F0	Manville	0	0	0
5/23/2004	7:26 PM	F2	Pontiac	0	0	0
5/30/2004	5:11 PM	F1	Pontiac	0	0	0
5/30/2004	5:12 PM	F0	Dwight	0	0	0
5/30/2004	5:32 PM	F0	Saunemin	0	0	0
5/30/2004	5:40 PM	F0	Cullom	0	0	0
4/2/2006	6:23 PM	F0	Flanagan	0	0	0
6/4/2008	18:45 PM	F1	Flanagan	0	0	40K
6/7/2008	15:21 PM	F0	Cornell	0	0	0K
6/7/2008	15:31 PM	F1	Nevada	0	0	50K
3/8/2009	12:01 PM	F0	Rooks Creek	0	0	20K
6/5/2010	19:58 PM	F3	Missal	0	0	750K
6/5/2010	20:12 PM	F2	Sunbury	1	13	3.0M
6/5/2010	20:16 PM	F0	Sunbury	0	0	100K
6/5/2010	20:31 PM	F0	Blair	0	0	20K
6/5/2010	21:08 PM	F0	Wing	0	0	2K

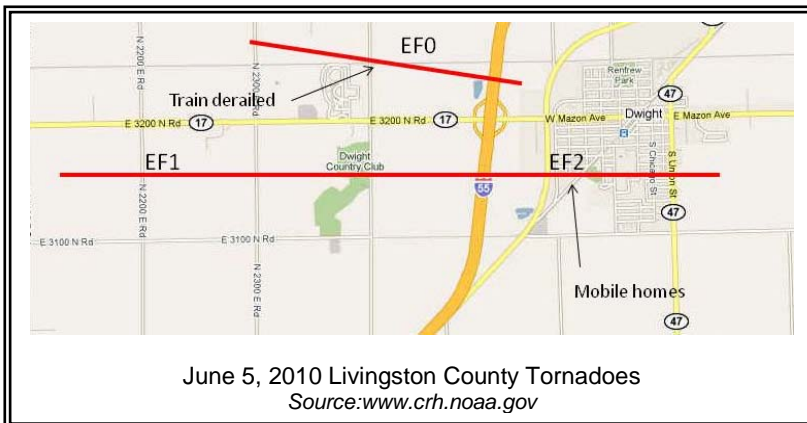
Source: NCDC







## June 5, 2010 – Tornado Event Narrative by the NWS:



“Very quickly after the tornado that hit Streator lifted, yet another tornado touched down over extreme northern Livingston county approximately one quarter mile south of the county line and about a half mile west of 1100 E Road. Shortly after touching down, this tornado caused severe damage to homes on 1100 E Road and destroyed a barn as well. There were also several large trees downed in this location. As the tornado continued eastward, it completely collapsed a metal truss high tension electrical tower and bent over several other metal truss electrical

towers in its path, which is consistent with low end EF3 damage. At this time the tornado was moving through an extremely rural area, however there was also a lone hardwood tree in its path that was debarked, with only large de-leafed branches remaining. The tornado continued eastward crossing Illinois Route 170 just south of the LaSalle and Livingston county line where hardwood trees were snapped. Large trees were broken at a farm house and a machine shed and grain bins were destroyed. The tornado then moved eastward for several more miles downing multiple trees and resulting in some minor structural damage between 1700 E Road and 1800 E Road.

“The beginning of the Dwight tornado occurred about 6 miles west of Dwight and about a quarter mile south of IL Route 17. On N 2200 E Road, 0.3 miles south of IL Route 17, a farm house sustained damage to windows, siding, and shingles, with many trees uprooted or damaged. Outbuildings were also damaged. The tornado at this point was rated EF1, with a path width of 70 yards. Debris from this farm was spread 200 yards wide across the field at N 2300E Road. The tornado proceeded to strike the golf course at N 2400 E Road, where numerous large trees were snapped and uprooted. Golf cart sheds were unroofed or severely damaged. At this point the tornado was rated low end EF2 with a path width of 300 yards. The tornado then moved east across Interstate 55 and moved into Dwight, damaging a lumber yard and other businesses. At Williams Street and old Route 66 a mobile home park was hit. Fourteen people were injured. One person who was seriously injured, later died. At the mobile home park, 35 mobile homes were destroyed. Damage here was rated EF2. Large trees were uprooted and power poles were snapped at the railroad tracks. At a ball field a little farther east, trees and fences were damaged and an announcer's booth was destroyed. Slightly farther east, there was minor damage to a church, but the church's garage was destroyed. There was damage to the high school auditorium roof and facade, and a greenhouse. A storage garage was destroyed at the high school. The tornado then continued east into a subdivision between Philmar Street and Prospect Avenue, where many large trees were downed on top of homes. At Sunset Drive and Wilmac Street a garage door and roof were taken off. A roof was taken off a house on Linden Street a half block west of IL Route 47. Three houses were uninhabitable and had to be destroyed. More than 100 homes had some damage. Damage in Dwight was rated high end EF1 to low end EF2. The tornado dissipated in an open field east of Route 47.



“A secondary tornado occurred 3 miles northwest of Dwight in northern Livingston County. The tornado began near the intersection of Rd 3300N and 2300E, where it caused minor damage to a home and surrounding trees. The tornado continued to the southeast where it derailed a train off its tracks near 2400E Road. At this point, the tornado moved east causing minor damage to some area trees before crossing Interstate 55, where it then lifted. The tornado was rated EF0 with winds estimated at around 80 mph and a path width of 20 yards. EPISODE NARRATIVE: Severe thunderstorms, including a few long tracked supercells moved across central and northern Illinois, producing damaging winds, hail and tornadoes.”

## 2.6.2 Tornado Vulnerability Assessment

**Damage to Buildings:** Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Mobile homes,
- Homes on crawlspaces (more susceptible to lift), and
- Buildings with large spans, such as airplane hangers, gymnasiums and factories.

Structures within the direct path of a tornado vortex are often reduced to rubble. However, structures adjacent to the tornado's path are often severely damaged by high winds flowing into the tornado vortex, known as inflow winds. It is here, adjacent to the tornado's path where the building type and construction techniques are critical to the structure's survival.

In 1999, FEMA conducted an extensive damage survey of residential and non-residential buildings in Oklahoma and Kansas following an outbreak of tornadoes on May 3, 1999, which killed 49 people. The assessment found:

- The failure for many residential structures occurred where the framing wasn't secured to the foundation, or when nails were used as the primary connectors between the roof structure and the walls. A home in Kansas, for example, was lifted from its foundation. The addition of nuts to the foundation anchor bolts (connected to the wood framing) may have been all that was needed to prevent this.
- Roof geometry also played a significant role in a building's performance.
- Failure of garage doors, commercial overhead doors, residential entry doors or large windows caused a significant number of catastrophic building failures.
- Manufactured homes on permanent foundations were found to perform better than those that were not on solid foundation walls.

As demonstrated by the June 2010 tornadoes in Livingston County, the impact to mobile home communities can be devastating. The June 2010 tornado also did damage to homes with foundations, businesses, a church, and the Dwight High School.

To assess this potential for building damage, two tornado scenarios have been developed. The first examines the potential damage to home due to a tornado in a rural area of Livingston County; the second in an urban area (i.e., the City of Pontiac). The assessment uses the population and asset information presented in Section 2.2 of the Chapter (page 2-5 and Table 2-7 on page 2-8). The scenarios assume a tornado damage area of 5 square miles.

1. Rural area average building density:  
 $5 \text{ mi}^2 \times 11 \text{ houses/mi}^2 = 55 \text{ homes damaged}$   
 $55 \text{ homes} \times \$64,600 \text{ per home} \times 50\% \text{ of value damaged} = \$1.78 \text{ million}$
2. Urban average building density:  
 $5 \text{ mi}^2 \times 833 \text{ houses/mi}^2 = 4,165 \text{ homes damaged}$   
 $4,165 \text{ homes} \times \$47,100 \text{ per home} \times 50\% \text{ of value damaged} = \$98.1 \text{ million}$

Impact to buildings due to tornadoes is considered high.

**Damage to Critical Facilities:** Because a tornado can hit anywhere in the County, all critical facilities are susceptible to being hit. Schools are a particular concern, though, for two reasons. First they have larger numbers of people present, either during school or acting as a storm shelter, and second they have large span areas, such as gyms and theaters.

The 1990 Plainfield tornado was an unfortunate example of this. It struck the Plainfield High School, Grand Prairie Elementary School, St. Mary Immaculate Church and the gymnasium to the Church's elementary school. Cost to repair the two public schools was estimated at up to \$35 million. The Dwight High School, though undergoing some construction, was damaged by the June 2010 tornado.

Impact to critical facilities for tornadoes is moderate.

**Impact on People:** Livingston County lost a mobile home resident to the June 2010 tornado and others were injured. Residents living in mobile homes are more vulnerable than people in permanent homes. People can inadvertently put their lives in danger during a tornado, or have little or no warning.

Impact to people is high.

**Economic Impact:** The major impact of a tornado on the local economy is damage to businesses and infrastructure. A heavily damaged business, especially one that was barely making a profit, often has to be closed.

Infrastructure damage is usually limited to above ground utilities, such as power lines. Damage to roads and railroads is also localized. If it can't be repaired promptly, alternate transportation routes are usually available. Public expenditures include search and rescue, shelters, and emergency protection measures. The large expenses are for repairs to public facilities and clean-up and disposal of debris. Most public facilities are insured, so the economic impact on the local treasury may be small. Clean-up and disposal can be a larger problem. Though Livingston County did not receive a disaster declaration for the June 2010 tornadoes, some assistance was provided by IDOT for the cleanup.

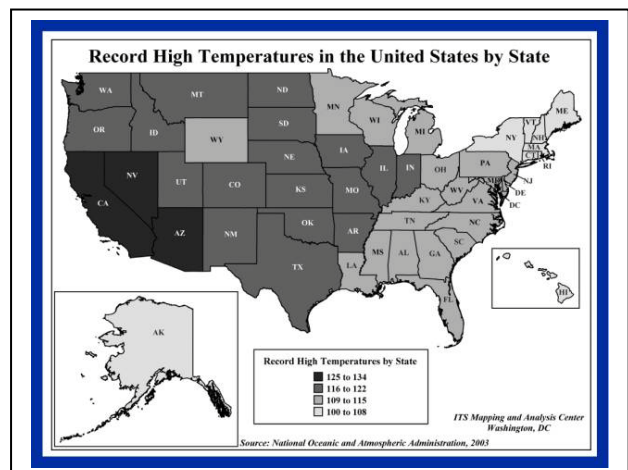
Economic impact of tornadoes is moderate.

## 2.7 Extreme Heat

### 2.7.1 Extreme Heat Hazard Description

Extreme heat is characterized by temperatures that hover 10 degrees or more above the average high temperature of a region for several days to several weeks. In comparison, a heat wave is generally defined as a period of at least three consecutive days above 90°F.

Extreme heat events are usually a result of both high temperatures and high relative humidity. (Relative humidity refers to the amount of moisture in the air.) The higher the relative humidity or the more moisture in the air, the less likely that evaporation will take place. This becomes significant when high relative humidity is coupled with soaring temperatures. On hot days the human body relies on the evaporation of perspiration to cool and regulate the body's internal temperature. Perspiring does nothing to cool the body unless the water is removed by evaporation. When the relative humidity is high, then the evaporation process is hindered, robbing the body of its ability to cool itself.



**Heat Alerts**

An excessive heat alert is an advisory or warning issued by the NWS when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines the type of alert issued. There are four types of alerts that can be issued for an extreme heat event:

- **Excessive Heat Outlook.** An excessive heat outlook is issued when the potential exists for an excessive heat event to occur within the next three to seven days.
- **Excessive Heat Watch.** An excessive heat watch is issued when conditions are favorable for an excessive heat event to occur within the next 12 to 48 hours.
- **Excessive Heat Advisory (northern Illinois).** An excessive heat advisory is issued when the heat index is expected to be between 105°F and 110°F, with a minimum temperature of 75°F or higher for two or more consecutive days.
- **Excessive Heat Warning (northern Illinois).** An excessive heat warning is issued when the heat index is expected to equal or exceed 110°F and the minimum temperature is 75°F for two or more consecutive days.

On average, more than 1,500 people die in the United States each year from extreme heat. This number is greater than the 30-year mean annual number of deaths due to tornadoes, hurricanes, floods and lightning combined. In an effort to raise the public's awareness of the hazards of extreme heat, the NWS has devised the "Heat Index".

**Heat Index:** The Heat Index, sometimes referred to as the "apparent temperature", is a measure of how hot it feels when relative humidity is added to the actual air temperature. The Heat Index chart (following page) shows the Heat Index as it corresponds to various air temperatures and relative humidity. As an example, if the air temperature is 96°F and the relative humidity is 65%, then the Heat Index would be 121°F. It should be noted that the Heat Index values were devised for shady, light wind conditions. Exposure to full sunshine can increase Heat Index values by up to 15°F. Also strong winds, particularly with very hot, very dry air, can be

extremely hazardous. When the Heat Index reaches 105°F or greater, there is an increased likelihood that continued exposure and/or physical activity will lead to individuals developing severe heat disorders, particularly those in higher risk groups. Generally, when the heat index is expected to exceed 105°F, the NWS will initiate extreme or excessive heat alert procedures.

**Heat Disorders:** Heat disorders are a group of illnesses caused by prolonged exposure to hot temperatures and are characterized by the body's inability to shed excess heat. These disorders develop when the heat gain exceeds the level the body can remove or if the body cannot compensate for fluids and salt lost through perspiration. In either case the body loses its ability to regulate its internal temperature. All heat disorders share one common feature: the individual has been overexposed to heat, or over exercised for their age and physical condition on a hot day. The following describes the symptoms associated with the different heat disorders.

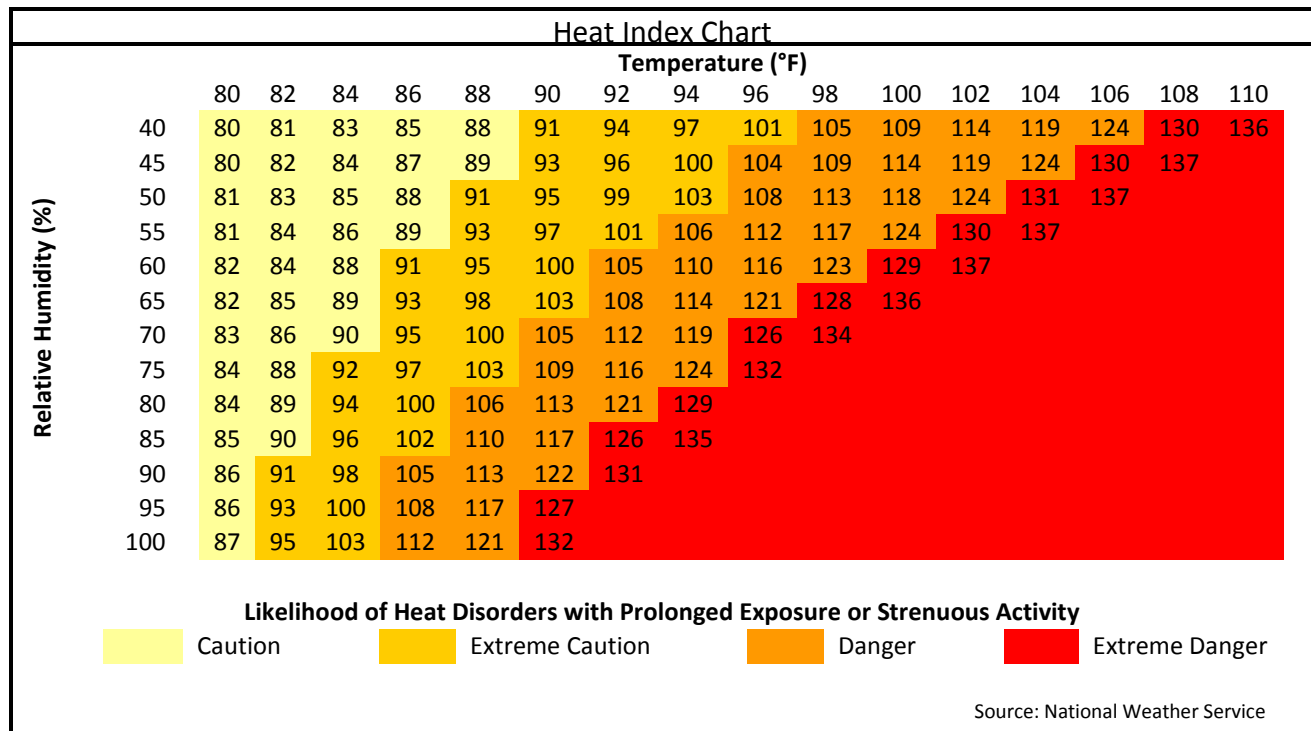
Relationship between Heat Index and Heat Disorders	
Heat Index (°F)	Heat Disorders
80°F – 90°F	Fatigue is possible with prolonged exposure and/or physical activity.
90°F – 105°F	Heat cramps, heat exhaustion and heat stroke possible with prolonged exposure and/or physical activity.
105°F – 130°F	Heat cramps, heat exhaustion and heat stroke likely; heat stroke possible with prolonged exposure and/or physical activity.
130°F or Higher	Heat stroke highly likely with continued exposure.

Source: NOAA

- **Sunburn.** Sunburn is characterized by redness and pain of skin exposed too long to the sun without proper protection. In severe cases it can cause swelling, blisters, fever and headaches. It can significantly retard the skin's ability to shed excess heat.
- **Heat Cramps.** Heat cramps are characterized by heavy sweating and painful spasms, usually in the muscles of the legs and possibly the abdomen. The loss of fluid through perspiration leaves the body dehydrated resulting in muscle cramps. This is usually the first sign that the body is experiencing trouble dealing with heat.
- **Heat Exhaustion.** Heat exhaustion is characterized by heavy sweating, weakness, nausea, exhaustion, dizziness and faintness. Breathing may become rapid and shallow and the pulse weak. The skin may

appear cool, moist and pale. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a mild form of shock. If not treated, the victim's condition will worsen.

- **Heat Stroke (Sunstroke).** Heat stroke is life-threatening condition characterized by a high body temperature (106°F or higher). The skin appears to be dry and flushed with very little perspiration present. The individual may become mentally confused and aggressive. The pulse is rapid and strong. There is a possibility that the individual will faint or slip into unconsciousness. If the body is not cooled quickly, then brain damage and death may result.



Studies indicate that, all things being equal, the severity of heat disorders tend to increase with age. Heat cramps in a 17-year-old may be heat exhaustion in someone 40 and heat stroke in a person over 60. Elderly persons, small children, chronic invalids, those on certain medications and persons with weight or alcohol problems are particularly susceptible to heat reactions.

## 2.7.2 Extreme Heat Hazard Analysis

Table 2-18 summarizes the previous extreme heat occurrences as well as the extent or severity of extreme heat events in Livingston County. The NCDC records show one recorded extreme heat event in Livingston County in July 1995; however, Livingston County was affected by the 1999 extreme heat event in northeastern Illinois. All of the extreme heat events recorded occurred in July and lasted between four and five days.

Heat-related deaths were reported for all three extreme heat events. However, in two of the three events, the heat-related deaths reported did not occur in Livingston County. The deaths reported took place in Lake, Grundy, Kane, Winnebago, Will and Cook Counties. In the case of the third event which covered seven counties, information on the location(s) of the heat-related deaths was not available.

**Table 2-18**  
**Extreme Heat Events Reported in Livingston County**  
**1995 through July 31, 2010**

Date	Temperature (°F)	Heat Index (°F)	Regional Impact*
July 12-16, 1995	Middle to upper 90s	High of 125°F	583 heat-related deaths; roads buckling and power outages
July 21-25, 1999	Lower to middle 90s	103°F – 111°F	13 heat-related deaths
July 28-31, 1999	Upper 90s to 100°F	105°F – 120°F	99 heat-related deaths

\*Deaths occurred in other counties; no reported deaths in Livingston County  
Source: NOAA

**Extent of Hazard and Probability of Future Occurrence:** Extreme heat events affect the entire County. All communities in Livingston County are vulnerable to the dangers presented during an extreme heat event. Three extreme heat events occurred in the course of two years, then no events for ten years. The odds of an extreme event happening in any year are about 50%.

### 2.7.3 Extreme Heat Vulnerability Assessment

In Illinois, vulnerability to extreme heat has primarily impacted the elderly and persons with pre-existing health problems who live in high-rise buildings or other housing with inadequate ventilation or cooling systems. Since these housing conditions are not prevalent in Livingston County, extreme heat is considered a lower priority hazard. If land-use changes elevate the risk from extreme heat, a vulnerability analysis can be conducted when this Plan is updated.

**Health and Safety:** Livingston County, like most areas of the Midwest, is very vulnerable to extreme heat. Urban areas are exposed more acutely to the dangers of extreme heat due to heat being retained in asphalt and concrete and being released at night. This effect brings little relief to the area even in the nighttime. People are at risk for heat stroke or sun stroke, heat exhaustion, and dehydration. Children and the elderly are most at risk. Loss of life is common with extreme heat events.

Impact on people due to extreme heat is **high**.

**Damage to Buildings:** Heat has little or no impact on structures. Impact on buildings is **low**.

**Damage to Critical Facilities:** Extreme heat can have an impact on the demand on electric utilities, otherwise the impact to critical facilities due to extreme heat is **low**.

**Economic Impact:** Economic impact of extreme heat is **low**.

### 2.7.2 Extreme Heat Vulnerability Assessment

**Damage to Buildings:** Heat has little or no impact on structures. Impact on buildings is low. Since impact is low, the vulnerability of extreme heat has not been calculated.

**Damage to Critical Facilities:** Extreme heat can have an impact on water supply and the demand on electric utilities is elevated. The impact of extreme heat to critical facilities is low.

**Impact on People:** Livingston County, like most areas of the Midwest, is very vulnerable to extreme heat. Urban areas are exposed more acutely to the dangers of extreme heat due to heat being retained in asphalt and concrete and being released at night. This effect brings little relief to the area even in the nighttime. People are

at risk for heat stroke or sun stroke, heat exhaustion, and dehydration. Children and the elderly are most at risk. Loss of life is common with extreme heat events. Impact on people is high.

Economic Impact: Generally, extreme heat, and especially drought impact agricultural areas in the State and Livingston County. Economic impact of extreme heat is low.

## 2.8 Other Natural Hazards

Other natural hazards that exist in Livingston County are shown Table 2-2 (page 2-2),. As shown in Table 2-3 (page 2-3), other hazards such as drought, earthquakes, and dam failure have a low frequency and low impact. They are, however, important to understand.

### 2.8.1 Drought

#### 2.8.1.1 Drought Hazard Description

While there is no universally accepted definition of drought, it can generally be defined as a period of unusually persistent dry weather that continues long enough to cause serious problems such as crop damage and/or water supply shortages. A drought may also be defined as the cumulative deficit of precipitation relative to what is normal for a region over an extended period of time, usually a season or more. There are effectively four types of drought, differentiated based on the use and need for water.

Palmer Classification System	
Index Value	Description
4.0 or more	extremely wet
3.0 to 3.99	very wet
2.0 to 2.99	moderately wet
1.0 to 1.99	slightly wet
0.5 to 0.99	incipient wet spell
0.49 to -0.49	near normal
-0.5 to -0.99	incipient dry spell
-1.0 to -1.99	mild drought
-2.0 to -2.99	moderate drought
-3.0 to -3.99	severe drought
-4.0 or less	extreme drought

Source: National Drought Mitigation Center,  
University of Nebraska – Lincoln

**Meteorological Drought:** Meteorological drought is a period of well-below-average precipitation that spans a few months to a few years.

**Agricultural Drought:** An agricultural drought is a period when soil moisture no longer meets the needs of a particular crop to germinate and grow.

**Hydrological Drought:** Hydrological drought is a period when surface and subsurface water supplies (i.e., streams, lakes, aquifers, etc.) drop below normal levels.

**Socioeconomic Drought:** Socioeconomic drought is a period when water shortages begin to affect people when there is not enough water to meet human and environmental needs.

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. It is generally difficult to pinpoint the beginning and the end of a drought. Because the impacts of a drought accumulate slowly at first, a drought may not be recognized until it has become well established. Even during a drought there may be one or two months with above average precipitation totals. These wet months do not necessarily signal the end of a drought and generally do not have a major impact on moisture deficits. Droughts can be short, lasting just a few months, or they can persist for several years before regional climate conditions return to normal. While drought conditions can occur at any time throughout the year, the most apparent time is during the summer months. Nationally, drought impacts often exceed \$1 billion due in part to the sheer size of the areas affected.



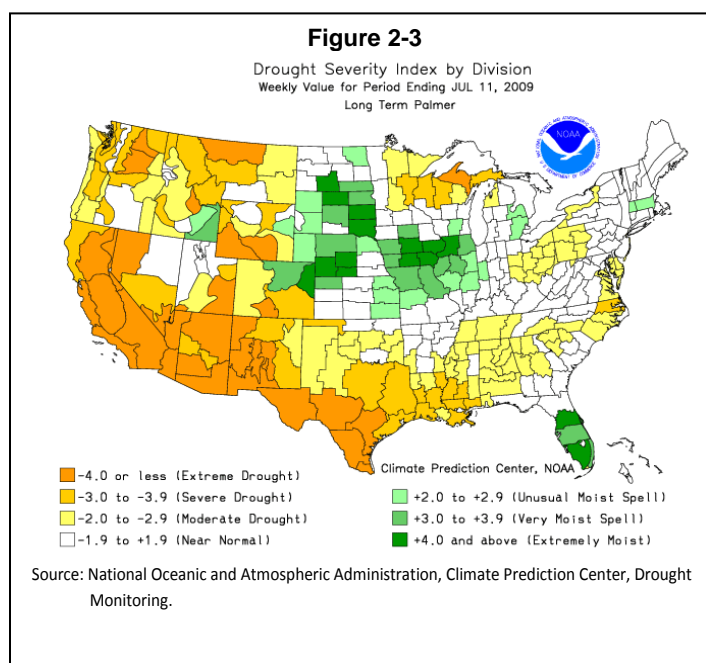
**Measuring Droughts:** There are several quantitative measures (indices) that have been developed to measure drought in the United States. How these indices measure drought depends on the discipline affected (i.e., agriculture, hydrology, meteorology, etc.) and the region being considered. The Palmer Drought Severity Index (PDSI) and the U.S. Drought Monitor will be highlighted in the Plan. The PDSI was the first comprehensive drought index developed in the United States. The U.S. Drought Monitor is a relatively new index that combines quantitative measures with input from experts in the field. NOAA has begun including the U.S. Drought Monitor's drought intensity ratings along with the weather information provided for drought events recorded with the National Climate Data Center.

**Palmer Drought Severity Index (PDSI):** The PDSI, or Palmer Index, was developed in 1965 and is a long-term meteorological index that indicates when weather conditions have been abnormally dry or abnormally wet. It is most effective at measuring impacts that are sensitive to soil moisture conditions, such as agriculture. Many federal and state agencies rely on PDSI to trigger drought relief programs. It provides a standardized method to measure moisture conditions so that comparisons can be made between various locations and times. The PDSI is most useful when working with large areas of uniform topography.

The PDSI is calculated based on precipitation and temperature data, as well as the local available water content of the soil and the cumulative patterns of previous months. The index ranges from +4 (extremely moist) to -4 (extreme drought). NOAA's Climate Prediction Center produces a weekly map that shows the climate divisions and their PDSI value by color. Figure 2-3 shows an example of this map.

**U.S. Drought Monitor:** A relatively new tool used for assessing drought conditions is the U.S. Drought Monitor. It is designed to provide the general public, media, government officials and others with an easily understandable "big picture" overview of drought conditions across the United States.

The U.S. Drought Monitor is unique in that it blends multiple numeric measures of drought, including the PDSI and three other indices, and the best judgments of experts to create a weekly map that depicts drought conditions across the United States. There are five drought intensity categories, D0 through D4, to identify areas of drought.



#### U.S. Drought Monitor – Drought Severity Classifications

Category	Possible Impacts
D0 (Abnormally Dry)	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.
D1 (Moderate Drought)	Some damage to crops, pastures; streams, reservoirs, or wells low; some water shortages developing or imminent; voluntary water-use restrictions requested.
D2 (Severe Drought)	Crop or pasture losses likely; water shortages common; water restrictions imposed.
D3 (Extreme Drought)	Major crop/pasture losses; widespread water shortages or restrictions.
D4 (Exceptional Drought)	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies.

Source: National Integrated Drought Information System, U.S. Drought Portal, "Drought Monitor: State-of-the-Art Blend of Science and Subjectivity", U.S. Drought Monitor, January 2008.



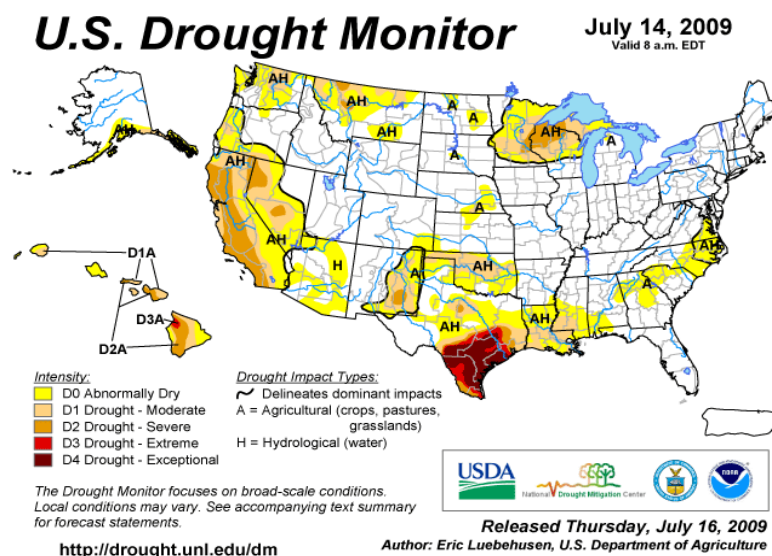
The U.S. Drought Monitor is designed to provide a general and up-to-date overview of current drought conditions across the country. It is not designed, however, to depict local conditions. As a result, there could be water shortages or crop failures within areas not designated as drought, just as there could be locations with adequate water supplies in an area designated as D3 or D4. Figure 2-4 shows an example of the U.S. Drought Monitor weekly map.

### 2.8.1.2 Drought Hazard Analysis

The following summarizes the previous drought occurrences as well as the extent or severity of drought events in Livingston County. Information obtained from the Storm Events Database and the Illinois Emergency Management Agency show three reported drought events in Livingston County between 1983 and August 31, 2009. Comprehensive damage information was either unavailable or none was recorded for any of the events. Also, no drought-related injuries or deaths were reported.

- In 1983, all 102 Illinois counties were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June.
- In 1988, approximately half of the counties in Illinois (including Livingston County) were impacted by drought conditions, although none of the counties were proclaimed state disaster areas. Disaster relief payments exceeding \$382 million were paid to landowners and farmers as a result of this drought.
- In 2005, drought conditions impacted much of the state, including Livingston County. Dry conditions reached a historic level of severity in some parts of Illinois and ranked as one of the three most severe droughts in Illinois based on 112 years of data.

**Figure 2-4 U.S. Drought Monitor Map**



Source: National Integrated Drought Information System, U.S.  
Drought Portal, U.S. Drought Monitor.

**Extent of Hazard and Probability of Future Occurrence:** Drought events affect the entire County in any one of the five drought categories discussed above. The County and municipalities rely on groundwater for their source of drinking water. The agricultural community will continue to be affected by droughts. All communities in Livingston County are subject to drought-related impacts. The odds of a drought in any year are most likely less than 10 %, but it is recognized that droughts can extend over multiple years. The 2007 Illinois Hazard Mitigation Plan estimated that the frequency of droughts in the state “occurs about once every 21 years.”

### 2.8.1.3 Drought Vulnerability Assessment

Livingston County can be significantly impacted by a drought. Surface water levels in lakes, impoundments, and reservoirs can drop dramatically during drought. Groundwater supply can also be impacted. Agricultural activities are impacted. A vulnerability assessment was not conducted for this Plan.

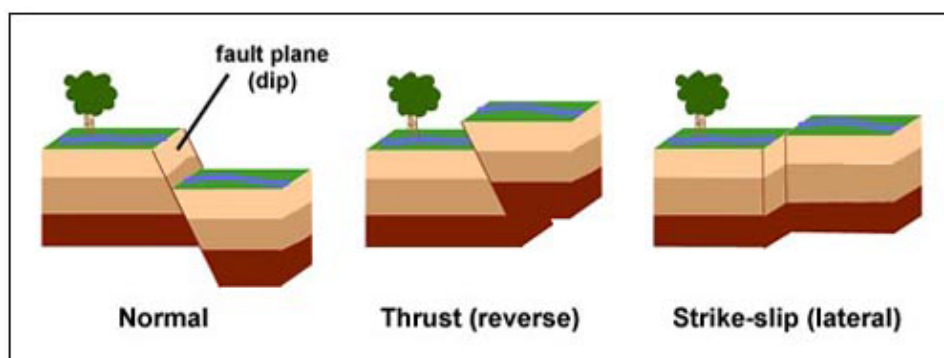
## 2.8.2 Earthquake

### 2.8.2.1 Earthquake Hazard Description

An earthquake is a sudden shaking of the ground caused when rocks forming the earth's crust slip or move past each other along a fault (a fracture in the rocks). Most earthquakes occur along the boundaries of the earth's tectonic plates. These slow-moving plates are being pulled and dragged in different directions, sliding over, under and past each other. An abrupt shift releases the energy, producing vibrations or seismic waves that travel outward from the earthquake's point of origin. The location below the earth's surface where the earthquake starts is known as the hypocenter or focus. The point on the earth's surface directly above the focus is the epicenter.

A fault is a fracture or zone of fractures in the earth's crust between two blocks of rock. Faults are classified based on the direction of slip or movement along the fault. There are three main groups of faults: normal, thrust (reverse) and strike-slip (lateral).

#### Earthquake Faults



Source: U. S. Geological Survey, Earthquake Hazards Program, “Visual Glossary – fault”.

The severity of an earthquake is measured in terms of its magnitude and intensity. The magnitude describes the size of the earthquake and the intensity depicts the associated damage.

**Magnitude:** Magnitude refers to the amount of seismic energy released at the hypocenter of an earthquake. The magnitude of an earthquake is determined from measurements of ground vibrations recorded by seismographs. As a result, magnitude is represented as a single, instrumentally determined value. There are several scales that measure the magnitude of an earthquake. The most well known is the Richter Scale. This logarithmic scale provides a numeric representation of the magnitude of an earthquake through the use of whole numbers and decimal fractions. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in ground vibrations measured. In addition, each whole number increase corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number.

The earthquake magnitude categories are based on an event's Richter Scale value. Earthquakes with a magnitude of 2.0 or less are not commonly felt by individuals. The largest earthquake to occur in the United States since 1900 took place off the coast of Alaska on March 28, 1964, and registered a 9.2 on the Richter Scale.

<b>Earthquake Magnitude Classes</b>	
<b>Class</b>	<b>Magnitude (Richter Scale)</b>
Micro	smaller than 3.0
Minor	3.0 – 3.9
Light	4.0 – 4.9
Moderate	5.0 – 5.9
Strong	6.0 – 6.9
Major	7.0 – 7.9
Great	8.0 or larger
Source: U.S. Geological Survey	

**Intensity:** Intensity refers to the effect an earthquake has on a particular location. The intensity of an earthquake is determined from observations made of the damage inflicted on individuals, structures and the environment. As a result, intensity does not have a mathematical basis; instead it is an arbitrary ranking of observed effects, and intensity generally diminishes with distance.

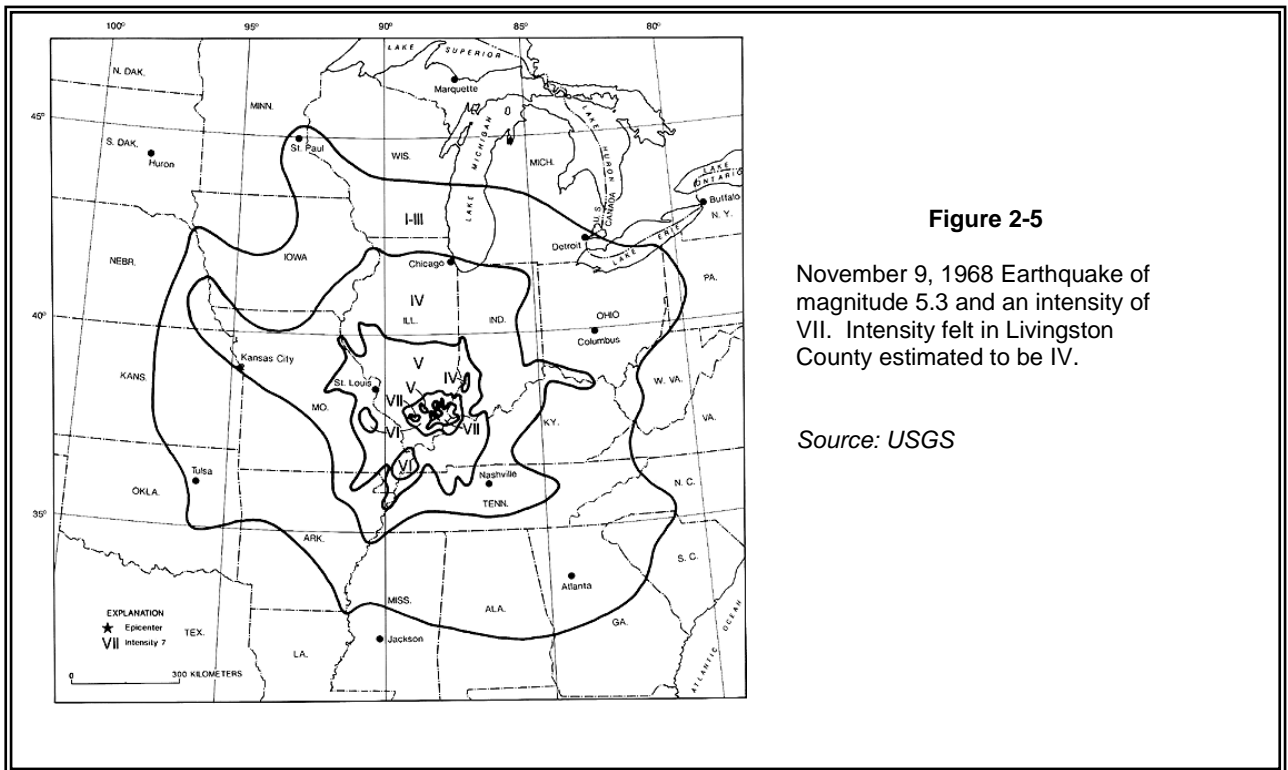
In the United States is the Modified Mercalli Intensity Scale is used to measure earthquake intensity. This scale, shown on the following page, is designated by Roman numerals. The lower numbers of the intensity scale are based on human observations (i.e., felt only by a few people at rest, felt quite noticeably by persons indoors, etc). The higher numbers of the scale are based on observed structural damage (i.e., broken windows, general damage to foundations etc.).

Earthquakes occur every day. Worldwide, small earthquakes, such as magnitude 2 earthquakes, occur several hundred times a day. Major earthquakes, such as magnitude 7 earthquakes, generally occur more than one a month. Earthquake intensity is directly related to the area and regional geology. Earthquakes in California, for example, are felt in relatively localized locations. Earthquakes in the Midwest can be felt a number of states away. Figure 2-5 shows the intensity for a 5.3 earthquake with an epicenter near the Illinois-Kentucky border.

Magnitude	Mercalli Intensity	Abbreviated Modified Mercalli Intensity Scale
1.0 to 2.9	I	Not felt except by a very few under especially favorable conditions.
3.0 to 3.9	II	Felt only by a few persons at rest, especially on upper floors of buildings.
	III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
4.0 to 4.9	IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
	V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0 to 5.9	VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
	VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.0 to 6.9	VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
	IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.0 and higher	X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
	XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
	XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

\*Typical Maximum Modified Mercalli Intensity – at epicenter

USGS “Did You Feel It” Program  
<http://earthquake.usgs.gov/earthquakes/dyfi/>

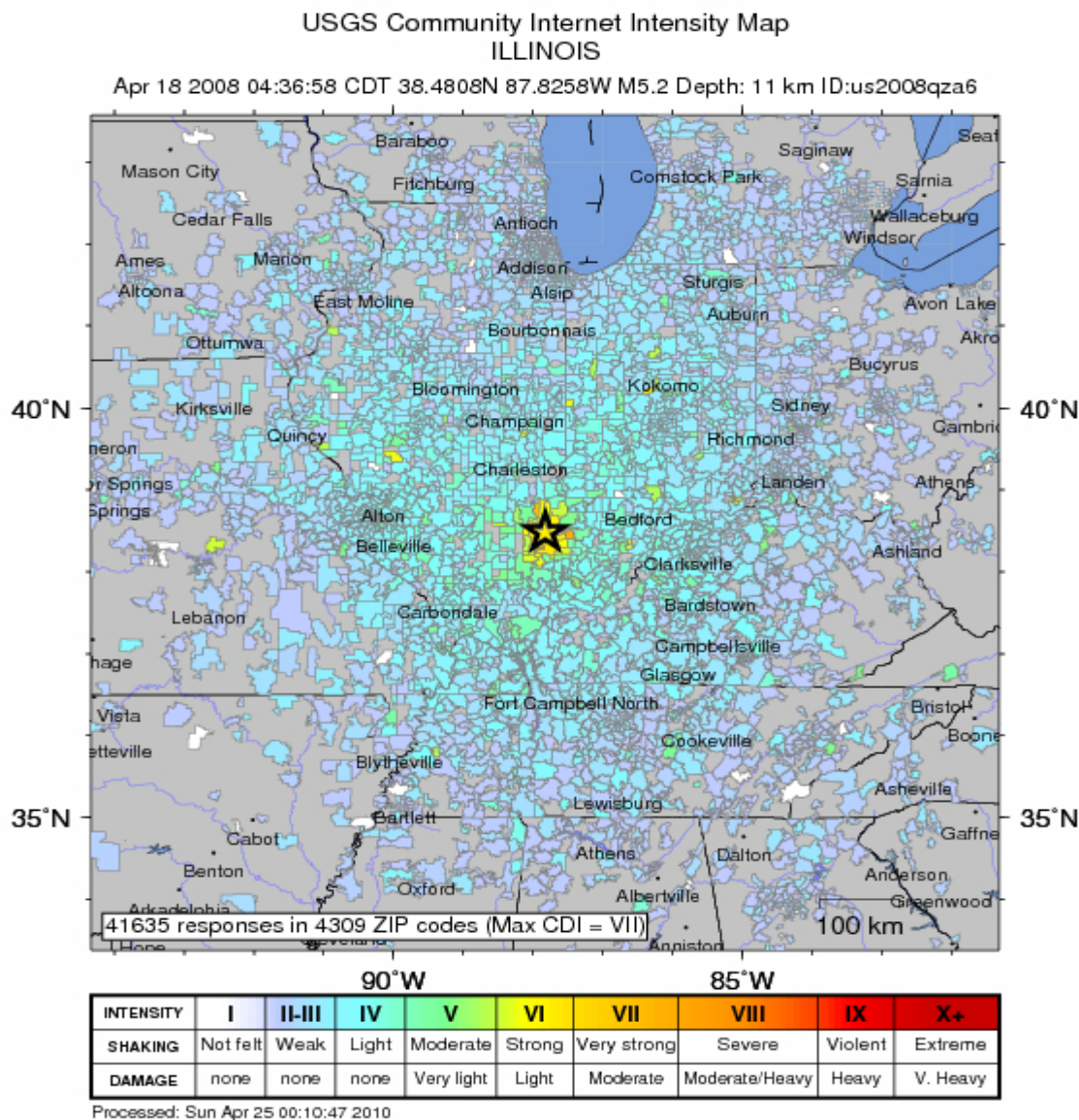


### 2.8.2.2 Earthquake Hazard Analysis

According to the Illinois State Geological Survey's "Northern Illinois Earthquakes" fact sheet and the "Earthquakes of Illinois: 1795 – 2008" map, no earthquakes have originated in Livingston County during the last 200 years. However, there have been at least a dozen earthquakes that have occurred in northern Illinois in the last century, though none of them were greater than a magnitude 5.1. These earthquakes generally caused minor damage within 10 to 20 miles of the epicenter and were felt over several counties. Earthquakes greater than a magnitude 5 are generally not expected in this region.

The most recent earthquake to take place in northern Illinois occurred on February 10, 2010, at around 4:00 a.m. USGS recorded the earthquake as 3.8 in magnitude with the epicenter at Pingree Grove in Kane County. Prior to that, a 5.2 earthquake on April 18, 2008, was felt in Livingston County. The epicenter of this earthquake was in Wabash County, Illinois. As shown in Figure 2-6, people in Livingston County reported feeling the earthquake. People can report to USGS through their "Did You Feel It" website. USGS classified the Livingston reports from the April 2008 earthquake as "II" or weak and "III" or light.

**Figure 2-6**  
**“Did You Feel It” Reports for April 18, 2008 Earthquake in Wabash County, Illinois**



The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and Kentucky. Ground shaking was felt over all or parts of 18 states in the central United States and southern Ontario, Canada. No damages were reported in Livingston County.

Other recent, notable earthquakes include the June 28, 2004, magnitude 4.2, earthquake located approximately eight miles northwest of Ottawa in La Salle County and was felt over six states. There were no reports of significant damage and no damages were reported in Livingston County. Numerous other earthquakes occurred in Illinois with similar intensity (3.0 to 4.8) and no reports of damage.

The largest earthquake to take place in northern Illinois in the past several hundred years occurred on May 26, 1909. The exact location of this magnitude 5.1 earthquake isn't known, but the greatest damage occurred in and

near Aurora where many chimneys fell and gas lines were ruptured. Minor structural damage was reported across northern and central Illinois and southern Wisconsin. Ground shaking was felt over seven states. Damage to chimneys and household items was reported in Livingston County.

The strongest earthquake in the central United States during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.3 earthquake occurred on November 9, 1968 (see Figure 2-5) with an intensity estimated VII in the area of the epicenter and an intensity of III to IV in Livingston County. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern United States and southern Ontario, Canada. As with the previous earthquakes, no damages were reported in Livingston County.

Two of the three largest earthquakes ever recorded within the continental United States took place along the New Madrid seismic zone in 1811 and 1812 with magnitudes of 8.1 and 8.0 respectively. These great earthquakes, centered near the town of New Madrid, Missouri, devastated the surrounding region and rang church bells 1,000 miles away in Boston. The quakes locally changed the course of the Mississippi River and created Reelfoot Lake, which covers an area of more than 10 square miles in northwestern Tennessee. If another earthquake the magnitude of those recorded 1811 and 1812 occurs again along the New Madrid seismic zone, the damage that will be experienced in northern Illinois and Livingston County is not expected to be substantial.

Extent of Hazard and Probability of Future Occurrence:  
Earthquakes events can affect the entire County. Impact is expected to be relatively uniform throughout the County. Table 2-19 shows earthquake probability for the New Madrid Seismic Zone from 2000 and into 2035. Earthquakes happen every year in Illinois. Earthquakes have been felt in Livingston County the last two years. The odds of feeling an earthquake in a year are about 50 %, but the odds of incurring damage from the earthquake are less than 1%.

**Table 2-19  
Probability of  
Earthquake Events in  
The New Madrid Seismic Zone**

Richter	Year 2000	Year 2035
6.3	40% - 63%	86% - 97%
7.6	5.4% - 8.7%	19% - 29%
8.3	0.3% - 1.0%	2.7% - 4.0%

*Source: Illinois State Geological Survey*

### 2.8.2.3 Earthquake Vulnerability Assessment

Since earthquakes are currently considered a lower priority hazard for Livingston County, a vulnerability analysis was not conducted. Earthquake vulnerability may be limited to historic structures in Livingston County. Other earthquake concerns relate to the interruption of natural gas for heating in the winter. If deemed appropriate, earthquake vulnerability will be examined in the 5-year update of this Plan.

## 2.8.3 Dam Failure

### 2.8.3.1 Dam Failure Hazard Description

A dam is an artificial barrier constructed across a stream channel or a man-made basin for the purpose of storing, controlling or diverting water. Dams typically are constructed of earth, rock, concrete or mine tailings. The area directly behind the dam where water is impounded or stored is referred to as a reservoir.

A dam failure is the partial or total collapse, breach or other failure of a dam that causes flooding downstream. Dam failures can result from natural events such as a flood event, earthquakes or landslides, human-induced events such as improper maintenance, or a combination of both. In the event of a dam failure, the people, property and infrastructure downstream could be subject to devastating damage.

Dam failures can result from one or more of the following:

- Prolonged periods of rainfall and flooding (the cause of most failures);
- Inadequate spillway capacity resulting in excess flow overtopping the dam;
- Internal erosion caused by embankment or foundation leakage ;
- Improper maintenance (including failure to remove trees, repair internal seepage problems, maintain gates, valves and other operational components, etc.);
- Improper design (including use of improper construction materials and practices);
- Negligent operation (including failure to remove or open gates or valves during high flow periods);
- Failure of an upstream dam on the same waterway;
- Landslides into reservoirs which cause surges that result in overtopping of the dam;
- High winds which can cause significant wave action and result in substantial erosion; and
- Earthquakes which can cause longitudinal cracks at the tops of embankments that can weaken entire structures.
- Animal activity (burrowing)

**Dam Regulation and Classifications in Illinois:** IDNR-OWR regulates dam construction and modification, and maintains an inventory of dams. Dams that either have been subject to an IDNR-OWR permit, or that have a height of 25 feet or more and have more than a 50 acre-foot impounding area, are included in the inventory. Three classifications are used in Illinois for regulatory purposes (Class I, II and III). Table 2-20 provides a brief description of each hazard classification. The hazard classifications used in Illinois are similar to those used by the U.S. Army Corps of Engineers and are based on the degree of threat to life and property in the event of a dam failure.

**Table 2-20**  
**Illinois Dam Hazard Classification System**

<b>Class</b>	<b>Description</b>
Class I	Dams located where failure has a high probability of causing loss of life or substantial economic loss downstream (i.e., a dam located where its failure may cause additional damage to such structures as a home, a hospital, a nursing home, a highly travelled roadway, a shopping center or similar type facilities where people are normally present downstream of the dam).
Class II	Dams located where failure has a moderate probability of causing loss of life or may cause substantial economic loss downstream (i.e., a dam located where its failure may cause additional damage to such structures as a water treatment facility, a sewage treatment facility, a power substation, a city park, a U.S. Route or Illinois Route highway, a railroad or similar type facilities where people are downstream of the dam for only a portion of the day or on a more sporadic basis).
Class III	Dams located where failure has a low probability of causing loss of life, where there are no permanent structures for human habitation, or minimal economic loss downstream (i.e., a dam located where its failure may cause additional damage to agricultural fields, timber areas, township roads or similar type areas where people seldom are present and where there are few structures).

Source: Illinois Administrative Code.

### 2.8.3.2 Dam Failure Hazard Analysis

Table 2-21 provides a list of Livingston County dams that have been permitted by IDNR-OWR. The list includes both privately and publically owned dams.



**Table 2-21**  
**Classified Dams with Livingston County**

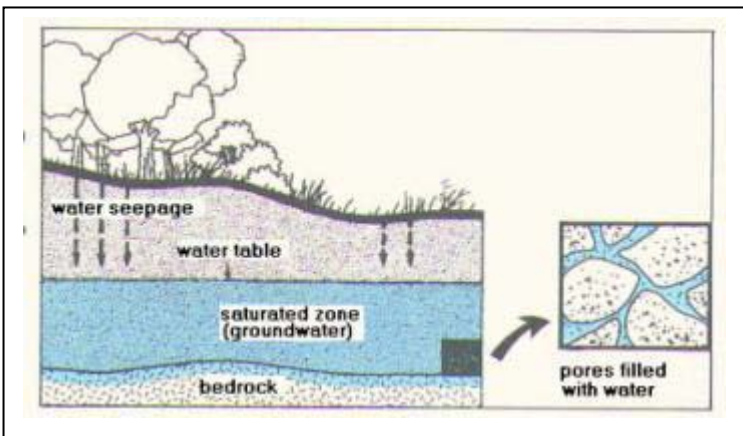
Name	Owner	Classification
Pontiac Quarry Dam	Illinois American	II
Pontiac Vermilion River Dan	Illinois American	III
Kempton Farm Dam	F&R Tilling, Inc.	III
Wolf Creek Golf Course Dam	Peter Dennys	III
Streator Vermilion River Dam	Illinois American	III
Lentman Lake Dam	Northern Illinois	III

### 2.8.3.3 Dam Failure Vulnerability Assessment

Since dam failure is currently considered a lower priority hazard for Livingston County, a vulnerability analysis was not conducted. Also, a dam-breach analysis and mapping of potential dam breach inundation areas is most appropriate for examining vulnerability. If deemed appropriate, dam failure vulnerability will be examined in the 5-year update of this Plan.

### 2.8.4 Groundwater Protection

The term "groundwater protection" refers to both the protection of groundwater quantity (or groundwater availability) and groundwater quality. All groundwater was at one time surface water. Rain and snow melt seeps or infiltrates into the ground. Water that infiltrates through the soil can eventually reach aquifers where groundwater is stored. Aquifers can be shallow, perched, deep, confined, unconfined, etc. Aquifer types and estimates of sizes can be mapped. Often the mapping of aquifer recharge areas is similar in shape and size as surface watershed boundary maps.



The quantity of groundwater and groundwater recharge, depends on the ability of runoff to reach a pervious surface where it can become seepage. Urban runoff reaching a storm sewer, for example, which discharges into a stream is effectively lost from the groundwater system.

The quantity and the rate that water seeps into the ground, and becomes stored groundwater, varies based on land use, soils, season, temperature,

and more. The quality of the groundwater is influenced by a number of factors. Different types of ground cover, soils and aggregate layers have differing abilities to filter the infiltrating waters. Because of human activity, much of the rain or snow melt runoff that becomes seepage has many opportunities to collect pollutants. Pollutants need to be filtered back out either while the water is still above ground, or when it is seeping through the ground. Because soils and aggregate layers may not have the ability to fully "treat" the seepage before it becomes groundwater, it is essential to reduce the human-caused pollutants.

## 2.9 Manmade Hazards

Manmade hazards can also pose risks to public health and property. The extent and magnitude of impacts from some manmade hazards can change as a result of natural hazard events. For example, severe winter storms can cause accidents involving trucks transporting hazardous substances that may result in the release of these substances. These releases can result in injury and potentially contamination of the natural environment. Consequently, the Planning Committee identified the prominent manmade hazards in Livingston County.

The priority manmade hazards for Livingston County have been categorized as follows:

- Transportation Incidents
- Radiological Release
- Utility Disruption
- HazMat
- Hazardous Substances
- Waste Remediation

### 2.9.1 Transportation Incident

Transportation incidents on roads are the most frequently occurring hazard of all the natural and manmade hazards in Livingston County. Transportation incidents are separated into the following categories: air, rail and roads.

**Air:** Flying remains one of the safer modes of transportation, based on frequency of accidents, in the United States. Commercial aircraft accidents, while relatively rare, receive intense news media attention. However, private aircraft accidents account for the majority of aircraft accidents. The majority of accidents occur immediately after take-off and during landing. While no large commercial airline service is available in Livingston County, one public airport is located in Pontiac.

No air crashes in the past 13 years have occurred at the Pontiac airport according to Sarah Peterson, Airport Manager. The Pontiac airport reported 11 based aircraft and approximately 12,000 total operations in 2009.

**Rail:** Illinois has the nation's second largest rail system with approximately 7,200 miles of railroad track. Livingston has approximately 112 miles of railroad track that includes daily service between Chicago and Springfield provided by Amtrak. Five other railroads also operate rail lines through Livingston County. A rail accident can be a derailment, release of cargo or a collision with a vehicle or another train crossing the track.

Livingston County has 210 railroad crossings. The Illinois Commerce Commission (ICC), is the state agency with regulatory authority over railroads. The ICC's rail safety staff conduct inspections of railroad tracks, rail operations, hazardous material transportation, and rail crossings. Between 2004 through 2009, there have been 4 collisions at Livingston County railroad crossings. According to the Federal Railroad Administration, approximately 60% of all rail incidents are caused between rail and highway users at crossing sites. Twenty percent of rail incidents are to rail trespassers. In addition to collisions and trespasser incidents, between 6% and 10% of all rail transportation involve the movement of hazardous substances.

The protocol for moving spent nuclear fuel from nuclear power plants requires that the train be stopped and inspected before moving through Illinois and that it be escorted as it moves through the state. Inspection of the track ahead of the train is also required to reduce the risk of derailment.

While movement of nuclear material has been minimal as the Nation grapples with the issue of developing national or regional repositories, more rail movement is anticipated. According to the Illinois Commerce

Commission, there has never been a transportation accident resulting in the release of radioactive material; however, widespread concern remains regarding its safe transportation.

Derailments and releases of cargo involving non-radiological hazardous substances are assessed in Section 2.9.2.

**Roads:** Illinois has the nation's third largest highway system with 139,940 miles of highways, streets, and roads and over 26,400 bridges. Most of the traffic in Livingston County is carried on Interstate 55. This major highway connects Livingston County with Chicago, St. Louis and other nearby population centers. Routes 17, 24 and 116 carry smaller quantities of traffic east and west and connect with two other interstate highways, I-57 and I-39, located east and west of Livingston County. While this modern roadway system provides convenience and efficiency for commuters, it also aids in-state and intra-state commerce which includes the transport of hazardous substances.

Accident figures from the Illinois Department of Transportation from 2004 through 2008 were evaluated to identify the number of crashes, fatalities and injuries that have occurred in Livingston County. The last three columns of Table 2-22 show the number of trucks (excluding pickup trucks) involved in crashes along with the number of deaths and injuries involving truck crashes.

**Table 2- 22**  
**Vehicle Incidents in Livingston County: 2004 to 2008**

Year	Passenger Vehicles			Trucks		
	Crashes	Deaths*	Injuries	Crashes	Deaths*	Injuries
2004	917	20	311	69	0	8
2005	919	14	325	70	0	9
2006	731	8	252	63	0	8
2007	888	18	299	72	1	8
2008	910	6	272	88	2	11

\*Persons transported out of Livingston County for specialized health care that were injured or later died are not included in these figures.

**Safety and health:** Roadway accidents have been the most frequent and severe transportation problem in Livingston County. Fatalities and injuries from transportation accidents have outnumbered fatalities and injuries from all natural hazards in Livingston County during the past two decades. From 2004 through 2008, Livingston County averaged 290 injuries and 13 deaths annually from roadway accidents.

**Damages:** Occasionally transportation accidents have caused damages to buildings and infrastructure elsewhere in Illinois, but this seldom occurs.

**Historical events:** Roadway accidents accounted for 4,372 accidents in Livingston County during a recent five year period causing at least 1,459 injuries and 66 deaths. Four collisions occurred among Livingston County's 210 railroad crossings between 2004 and 2009.

**Probability of occurrence:** Vehicle accidents on Livingston County highways and roads are expected to continue at similar levels revealed in recent figures. The probability of occurrence for rail and aircraft accidents remains low.

## 2.9.2 Radiological Release

The term "radiological release" is used in this plan to refer to the release of significant levels of radioactivity or exposure of the general public to radiation. In Livingston County, exposure to significant levels of radioactivity

could occur: 1) through a release at one of the three nearby nuclear power facilities near Braidwood, LaSalle, and Dresden or 2) transportation accident of nuclear fuel assemblies (spent or new).

**Release from the Braidwood, LaSalle, and Dresden Nuclear Power Facilities:** Most commercial nuclear facilities constructed in the United States should withstand most natural hazards such as tornadoes and severe storms that frequently occur in Illinois. Nonetheless, the Illinois Emergency Management Agency has developed a Radiological Emergency Response Plan in cooperation with other state and local governments. The consequences associated with a release at any nuclear power facility would depend on the nature of the accident and prevailing weather conditions. An Emergency Planning Zone (EPZ) around each nuclear facility is assessed to estimate potential damages to the public and critical infrastructure. EPZ's typically include a 10-mile Critical Risk Zone and a 50-mile Ingestion Pathway Zone.

Livingston County is located outside the Critical Risk Zone for all three nuclear power facilities mentioned above. If the Critical Risk Zone were to be extended to 30 miles, portions of northern Livingston County would be within this zone.

The 50-mile Ingestion Pathway Zone for either nuclear power facility would include the majority of Livingston County. Ingestion refers to radiation that might enter a person's body through food and liquids. Protective actions to avoid or reduce potential ingestion of radioactive materials include a ban of contaminated food and water.

**Safety and health:** Radiation is measured in millirems. Illinois residents receive about 300 millirems of radiation a year from natural sources, such as light, heat or radio waves. Federal regulations allow workers to receive up to 5,000 millirems a year through exposure at the workplace. Dangerous levels that produce identifiable effects to humans begin at 20,000 millirems in a day. Exposure to dangerous levels of radiation can have varying health effects on people, animals and vegetation. Impacts range from minor health issues to fatal illnesses.

**Damages:** No major releases of radioactivity from nuclear power plants have occurred anywhere in the world except at the Chernobyl nuclear power plant in Russia. Consequently, measuring the potential damage to property is difficult to estimate.

**Historical events:** Two incidents occurred at nearby nuclear power facilities, but Livingston County was not impacted. One of these incidents resulted in an off-site release. In April, 2006, tritium was accidentally released into groundwater from the Braidwood facility. Tritium is a mildly radioactive form of hydrogen that occurs naturally and during the operation of nuclear power plants. Water containing tritium is normally released under controlled conditions to protect public health and safety. Exelon Corporation, the operator of this facility, took responsibility for this leak and paid for the installation of a new public water supply and began negotiations to compensate nearby property owners who had private drinking water wells.

In February, 2006, the LaSalle facility experienced a "site area emergency" (SAE). While refueling one of the two reactors, a malfunction of the turbine control system led to a temporary shutdown. No damage or release of radioactive material occurred.

**Probability of occurrence:** Nuclear power plants have been operating in counties adjacent to Livingston for approximately 50 years with no incidents impacting Livingston County. The probability of an incident impacting Livingston County appears low.

## 2.9.3 Utility Disruption

Livingston County and its municipalities rely on the delivery of utilities to residents and businesses. Utility interruption (or disruption) can occur as a result of a natural hazard, but it can also occur from manmade causes such as fires or transportation incidents. The following utility sources were assessed for Livingston County:

- Electric
- Communications
- Natural Gas

The impacts of electric utility disruptions are most significantly felt by the general population during the winter and the summer for heating and cooling purposes. However, any electric disruption creates business losses as computers, lighting, refrigeration, gas pumps and other equipment is without power. Severe summer and winter storms, tornadoes, and floods can bring trees and tree limbs down on power lines. These events also cause serious safety hazards. Manmade causes can be due construction accidents or over-use of regional power grids.

Communication towers have been built across Illinois and in Livingston County to aid with the increased use of cell phones. These towers are far less vulnerable to high wind and severe weather damage than other critical infrastructure. Occasionally these towers pose a hazard for migrating birds, but pose little to no hazard to Livingston County residents.

Many homes in Livingston County are heated with natural gas. Natural gas pipelines travels through Livingston County. Natural gas distribution could be disrupted by an earthquake.

**Safety and health:** Utility disruption can impact people and pets when heating and cooling sources are lost. During extreme cold and heat events, the elderly are generally the first population group to be adversely affected. Rural residents can also lose water pressure during electricity outages.

**Damages:** Damage to buildings and infrastructure are relatively low for utility disruption. Natural gas leaks, however, can cause explosions.

**Historical events:** Utility interruptions in the absence of severe weather have been infrequent in Livingston County.

**Probability of occurrence:** Not determined.

## 2.9.4 Hazardous Material Incident (HazMat) Incident

Hazardous materials, also referred to as hazardous substances, generally refer to flammable, explosive, biological, and chemical material that can potentially harm humans, animals or the environment. These materials are shipped daily on the nation's highways, railroads, waterways and pipelines. The term HazMat incident refers to an accident while these materials are being transported as well as to an accident where these materials are generated, stored, or used.

In Illinois during 2009, there were 1,162 HazMat incidents. Over 90% (1,162) of these incidents involved road transport and most of these incidents occurred in Cook and the collar counties. HazMat incident records for Livingston County are summarized in Table 2-23.

**Table 2-23**  
**HazMat Incidents in Livingston County: 2005-2009**

Year	Month/Day	Location	Material
2005	2-May	Pontiac	PCB Oil
2005	21-Sep	Pontiac	Crude Oil
2005	25-Sep	Ancona	Diesel Fuel
2006	7-Jan	Pontiac	Mercury*
2006	1-Feb	Pontiac	Crude Oil
2006	14-Feb	Dwight	Lead Acid Batteries*
2006	3-Aug	Cornell	Gas
2006	16-Oct	Pontiac	PCB Oil
2006	20-Dec	Pontiac	Crude Oil
2007	25-Apr	Pontiac	Crude Oil
2007	26-Dec	Cropsey	Dead Hogs (200-400 hogs died in a fire)
2008	27-Feb	Streator	Crude Oil
2008	19-Jul	Odell	DDT
2008	16-Sep	Fairbury	Diesel Fuel
2009	25-May	Cornell	Glyphosate, Pendinethalin, Chloransulam
2009	3-Jun	Pontiac	Crude Oil
2009	1-Jul	Dwight	Gas
2009	13-Jul	Odell	Diesel Fuel
2009	13-Nov	Dwight	Diesel Fuel
			(all three compounds are herbicides)

\*These incidents involved highway shipments of hazardous substances.

Source: IL Environmental Protection Agency, Bureau of Land, "Generators and Managers of Hazardous Waste in Illinois: 2007"

**Safety and health:** HazMat incidents in Illinois and across the Nation have resulted in serious injuries, evacuation of nearby residents, and environmental degradation requiring emergency cleanup actions. With the daily high volume of traffic on I-55, HazMat incidents are a concern in Livingston County. No fatalities or injuries requiring hospitalization were reported in Livingston County.

**Damages:** HazMat incidents have resulted in serious damages to buildings and infrastructure in Illinois and across the Nation. No widespread damages resulted from the recent HazMat incidents in Livingston County.

**Historical events:** Nineteen HazMat incidents have been recorded in Livingston County from 2005 through 2009. These incidents were similar to other rural counties in that agricultural chemicals, fuel, and oil are commonly involved. Fortunately, none of the Livingston County incidents caused severe (fatalities or hospitalization) or widespread impacts. Two of these incidents caused temporary road closures while emergency cleanup activity was conducted.

**Probability of occurrence:** Based on records of the most recent five year period, Livingston County has experienced approximately five HazMat incidents annually. The use of hazardous substances in agribusiness and elsewhere in the County coupled with the number of facilities that handle hazardous substances along with the level of truck, pipeline, and rail transit suggest that hazmat incidents are likely to continue, but these incidents should not be expected to occur at that same frequency experienced as areas with more urbanization and industry.

## 2.9.5 Hazardous Substances

Hazardous substances broadly include any biological, chemical, or physical materials that pose harm to public health or the environment. The following subsections identify the general pathways—generation, transportation, disposal and remediation—by which hazardous substances may pose risks to public health and safety.

**Generation:** Municipalities and counties where hazardous substance fabrication, processing and storage sites exist are at risk for a hazard event. Facilities that have airborne releases resulting from their industrial processes or reportable quantities hazardous substances sent off-site for disposal are also included in the list below. Livingston County has five sites that generate sufficient quantities of hazardous substances. The name, location, category of hazardous substance, and amount generated or released are from the most recent records made available by the Illinois Environmental Protection Agency and the United States Environmental Protection Agency. These records include the Toxic Release Inventory Reports and the Resource Conservation and Recovery Act (RCRA) Generator Reports.

**Table 2-24  
Generators of Hazardous Substances in Livingston County**

Name/Location	Waste	Tonnage
UFC/Interlake Holding 701 Interlake Drive Pontiac	Paint and ink sludges	33.938
	Caustic liquids (pH> 12.5)	2.221
	Contaminated debris: rags, containers, other solids	5.409
	Spent concentrated acid	.224
	Paint, ink, varnish (fluid not sludge)	.678
	Total Tons	42.470
Nicor Gas 20266 E 1600 N Road Pontiac	Paint thinner or petroleum distillates	.133
	Other organic liquids	1.890
	Contaminated debris: rags, containers, other solids	.137
	Total Tons	2.160
IL Dept. of Transportation	Inorganic solids	156.120
	Total Tons	156.120
RR Donnelley 1600 N. Main St. Pontiac	Glycol Ethers	1.51
	Total Tons	1.51
Caterpillar Inc. 4-H Park Road Pontiac	Chromium	1.45
	Total Tons	1.45

None of these three facilities have ongoing or unresolved violations. In addition, there are four generators located in Streator near the LaSalle-Livingston County line. As with the facilities located in Livingston County, these four nearby facilities do not have any violations that pose threats to public health and safety.

**Rails:** The Illinois Commerce Commission is required to maintain records on railway accidents which involve hazardous materials. Except for 2009, railway accident records since 2000 indicate that the annual number of accidents in Illinois involving hazardous substances has ranged between 73 and 113. In 2009, Illinois experienced a reduction in this kind of railway accident as the number diminished to 35.

Since 2000, Livingston County has experienced two accidents involving rail transport of hazardous substances. Descriptions of both accidents and a comparison with the number of rail accidents in the Chicago area and other downstate counties is included in Table 2-25.

Railway accident figures are divided into three categories:

- A—derailments resulting in a release of hazardous substances
- B—derailments where hazardous substances were transported but no release occurred
- C—releases of hazardous substances from railroad occurred, but no derailment was involved



**Table 2-25**  
**Rail Incidents involving Hazardous Substances: 2009-2000**

Year	Category.	Livingston County	Cook & Collar Counties	Downstate
2009	A	0	1	4
	B	0	2	3
	C	0	13	12
2008	A	0	4	3
	B	0	2	2
	C	0	36	26
2007	A	0	5	2
	B	0	8	2
	C	0	46	35
2006	A	0	1	5
	B	0	6	6
	C	0	58	38
2005	A	0	2	9
	B	1*	3	4
	C	0	28	29
2004	A	0	6	10
	B	0	2	2
	C	0	30	28
2003	A	0	1	3
	B	1**	2	4
	C	0	46	27
2002	A	0	6	7
	B	0	1	5
	C	0	44	29
2001	A	0	1	3
	B	0	3	10
	C	0	36	28
2000	A	0	4	1
	B	0	1	5
	C	0	32	35

\* A misaligned switch is suspected of causing a derailment involving 30,000 gallons of a flammable liquid on September 25 involving the BNSF railroad. No release occurred.

\*\* A derailment involving battery fluid on February 11 involving the BNSF Railroad. No release occurred.

According to the Association of American Railroads (AAR), approximately 6% of all rail traffic involves the movement of hazardous substances. Illinois' rail system is the country's second largest, with the Chicago and East St. Louis terminals being two of the nation's busiest. Since 2000, hazardous substances moving through Illinois account for between 6 and 10 % of the total Illinois freight traffic. Annual tonnage of hazardous substances moving through Illinois has varied in recent years from approximately 30 million tons to 47 million tons.

The top 20 hazardous substances moved through rail traffic include: sodium hydroxide, petroleum gases (liquefied), sulfuric acid, anhydrous ammonia, chlorine, sulfur, vinyl chloride, propane, fuel oil, denatured alcohol, methanol, gasoline, phosphoric acid, hydrochloric acid, styrene monomer, carbon dioxide (refrigerated liquid), ammonium nitrate, gasoline, sodium chlorate, and diesel fuel.

Major railroad lines in Livingston County include:

- Bloomer Line (BLOL)
- Burlington Northern Santa Fe (BNSF)

- Norfolk Southern (NS)
- Toledo, Peoria and Western (TPW)
- Union Pacific (UP)

Amtrak provides daily passenger service between Chicago and St. Louis utilizing the UP line through Livingston County with stations in Pontiac and Dwight.

**Pipelines:** Energy gases (natural gas and liquefied petroleum gas) and petroleum liquids (crude oil and gasoline) are carried in pipelines across Illinois. These pipelines are buried and above-ground.

Sabotage and seismic activity may trigger releases from these pipelines. Continual monitoring and maintenance of pipelines is necessary to prevent malfunctions from corrosion, aging, or other factors that could also lead to a release. In Livingston County, there have been six incidents involving pipelines since 2005. Four of these incidents involved small quantities of crude oil and were quickly remediated with no off-site impacts. Two incidents are undergoing remediation through the State Remediation Program and they both involve crude oil.

#### **Waste Disposal:**

##### Solid Waste (Household)

Waste disposal has caused surface water and ground water contamination in Illinois and across the Nation. In Illinois, thirty-three solid (also referred to as household) waste disposal sites that are closed have been identified as posing threats to the environment. Solid waste disposal sites are assessed in this Plan because they also contain small quantities of hazardous waste that include batteries, paint, pesticides, and pharmaceuticals. Violations have also been identified at other waste disposal sites that are still operating in addition to closed sites. While recycling activity has increased during the past two decades, the majority of solid waste (waste generated in households) is disposed of in landfills.

The 22<sup>nd</sup> Annual Landfill Capacity Report prepared by the Illinois EPA indicates that Livingston County residents generated approximately 46,350 tons of solid waste during 2008. Of the approximately 46,350 tons, 9,000 tons were recycled. There are two landfills with capacity to receive waste in Livingston County: 1) Livingston Landfill (Pontiac), and 2) Streator Area Landfill # 3.

Livingston Landfill, Pontiac, accepted approximately 3.2 million gate cubic yards of waste for disposal, making it the fifth largest landfill in Illinois in terms of amount of waste received. All of the waste received at the Livingston Landfill is from Illinois.

The Streator Area Landfill #3 had submitted a permit application to expand its capacity. However, following a change in ownership, the permit application was withdrawn and this landfill is in the process of closing.

There are currently ten landfills that serve the 19 county East-Central region of Illinois that includes Livingston County. Of the eight landfills located outside of Livingston County, American Disposal Services Landfill # 2 in Bloomington (McLean County) is the closest. None of these eight landfills pose a threat to Livingston County residents. At the present rate that solid waste is being generated, the IEPA estimates that there is sufficient capacity to meet waste disposal needs of this region for the next 30 years.

##### Hazardous Waste

###### *Off-Site Disposal*

There are no off-site hazardous waste disposal facilities operating in Livingston County.

###### *On-Site Disposal*

There are no on-site hazardous waste disposal facilities operating in Livingston County. One hazardous waste generator near the Livingston County line disposes some waste on-site. The location, method of disposal, and amount of waste disposed is found in the following table.

**Table 2-26**  
**On-Site Disposal of Hazardous Waste Adjacent to Livingston County: 2007**

<u>Name/Location</u>	<u>Disposal Method</u>	<u>Tonnage</u>
Plymouth Tube-Streator	Neutralization	394.800

There are presently no violations at this facility.

**Safety and health:** Hazardous substances can pose a threat to residents in their workplace and where they reside. The type and quantity of the substance, the pathway of exposure (ingestion, dermal, etc.), and the frequency of exposure are factors that will determine the degree of impact. Numerous cases covering a wide range of safety and health impacts have been documented.

**Damages:** Damages to buildings have occurred primarily in the workplace in the form of scarring to floors and walls. Fire and explosions have also occurred primarily through safety lapses, and loading/unloading operations. A recent example in Central Illinois illustrates the extent of damage that can occur. In addition to killing 5 persons and injuring others, an explosion in April, 2004, at the Formosa Plastics facility in Illiopolis resulted in an evacuation of residents. The damage to this industrial facility was so severe that the facility will not reopen.

**Historical events:** On-site generation of hazardous substances at permitted sites in Livingston County has not presented ongoing problems for adjacent property owners. The facilities identified in this section are in compliance with state and federal environmental regulations and they have no unresolved violations. Six incidents occurred at pipelines all involving crude oil. All of the pipeline incidents, except for two, involved small quantities and were promptly remediated. The other two pipeline incidents are going through the voluntary State Remediation Program.

**Probability of occurrence:** Facilities in Livingston County that generate and use hazardous substances generally have relatively low to moderate size quantities. These facilities have environmental controls. The probability of occurrence should remain relatively low unless lapses in safety practices were to occur.

While there appears to have been more transportation accidents involving hazardous substances than accidents in the workplace, the number of these transportation accidents suggests that the probability of occurrence is also relatively low.

The frequency of waste migrating off-site from waste disposal sites has lessened considerably with the passage of stronger design and operating requirements after 1970. The primary threat to public health posed by off-site waste migration is contaminated drinking water supplies. Considering the small number of waste disposal sites in Livingston County and the proximity of municipal and private drinking water wells, the probability of this threat is also relatively low.

## 2.9.6 Waste Remediation

Hazardous waste remediation in Illinois is primarily handled through two programs: the federal Superfund program and the state Site Remediation Program. Sites that pose the largest threat to public health and the environment are typically found in the Superfund program. Most other hazardous waste sites are handled through the Site Remediation Program.

**Superfund (National Priorities List) Sites:** Since the advent of the national Superfund program in 1981, there have been 51 Superfund sites in Illinois. *There are no Superfund sites in Livingston County and there are no candidate sites awaiting proposal to the National Priorities List.*

**Illinois Site Remediation Program (non-Superfund):** Sites that do not qualify for the federal Superfund program but where hazardous waste exists that pose a risk to public health and the environment are regulated through the Illinois Site Remediation Program. Since the mid-1980's, remediation activities have been conducted and monitored at nearly 4,000 sites in Illinois. When inspections and sampling results indicate that remediation objectives have been achieved, the Illinois EPA issues a No Further Remediation letter to the property owner. This letter describes what remediation activities have been taken and whether any portion of the property, based on future property use, might need additional remediation.

There are six (6) sites in Livingston County as shown in Table 2-27. Three other sites have received No Further Remediation letters from the Illinois Environmental Protection Agency. The remaining six sites awaiting No Further Remediation letters are listed below.

**Table 2-27**  
**Sites Identified for Remediation of Hazardous Substances**

Site Name	Location	Approximate Size	Primary Waste
Smith-Douglas	South Streator	124 acres	gypsum & fertilizer
Ocoya Landfill	Ocoya	57 acres	solid waste w/low levels of hazardous components
Kenny Morrison	South Streator	23 acres	solid waste w/suspected hazardous components
CCPS Transportation	n/a	155 acres	crude petroleum
Explorer Pipeline	n/a	45 acres	naphthalene, benzene, xylene
Agro Distribution	n/a	6.5 acres	fertilizer

The primary threats posed at these locations are largely on-site with the possible exception being the Explorer Pipeline site, the closed Ocoya landfill, and the closed Smith-Douglas facility. Steps have been completed to prevent public access, partially remove waste and contaminated soil, and restrict exposure pathways for workers who must be on these sites.

At Explorer Pipeline, a drinking water well survey will need to be conducted based on the quantities of contaminants identified in on-site soils. Based on a site investigation there is concern that some contaminants might potentially move off-site. Consequently, any nearby drinking water wells must be identified to determine what risk, if any, exists for these residents.

The Ocoya landfill was built in the old Ocoya Stone Company quarry and does not rise above the natural ground elevation. The cover of the landfill is inadequate which is allowing too much precipitation to enter the landfill which is causing seeps of leachate (a liquid mixture of waste) to form. An improved cover for the landfill is needed to prevent waste from flowing out of the landfill, somewhat similar to an overflowing bathtub, where it could impact three small ponds, Rooks Creek, and eight homes in the vicinity.

The Smith-Douglas facility has received the most remediation of any of these sites. While most of the hazards posed by this site have been addressed, a gypsum pile and ponds that contained highly acidic waste will need covering and monitoring to assure that no off-site impacts occur.

**Leaking Underground Storage Tanks:** Petroleum products leaking from underground storage tanks are regulated through the Leaking Underground Storage Tank program. This program began in the late 1980's as a result of the threats posed by vapors in homes and businesses, contaminated groundwater, and contaminated

soil. In Illinois over 14,500 acres of soil contaminated by leaking underground tanks have been remediated since 1988. ***In Livingston County there are 116 cases involving remediation of leaks and contaminated soil*** through this program.

Sixty-nine sites have received No Further Remediation Letters (NFR) from the IL EPA. Most of the remaining sites have submitted reports describing the extent of the leak and remediation activities taken to date. Some of these sites await further action by the site owners. Seven sites have received a “high priority classification,” and all of these sites have either received an NFR letter or the remediation has been virtually completed.

**Safety and health:** Remediation of uncontrolled waste sites on a nationwide basis began in the early 1980's through enactment of the federal Superfund program following numerous cases of environmental degradation and risks to public health and safety. However, sites that also posed risks to public health and safety were discovered that did not qualify for aid through the Superfund program. Superfund and non-Superfund sites are remediated under the direction of the Illinois EPA. The Illinois Department of Public Health provides health assessments and assistance to residents to prevent or treat health problems. While a wide range of safety and health concerns have been documented at these sites in Illinois, sites located in Livingston County that are in the Site Remediation Program or the Leaking Underground Storage Tank Program have not caused as severe health, safety or environmental impacts that have been experienced at other locations.

**Damages:** Although no fatalities, injuries, or chronic health impacts attributed to these sites have been identified among Livingston County residents, contaminated soil and groundwater has occurred. Steps to prevent exposure to contaminants from these sites have been initiated while permanent remediation activities are being completed.

**Historical events:** The closed Smith-Douglas fertilizer facility is the largest waste remediation site in Livingston County. This site has received considerable attention during the past two decades to resolve acute and chronic problems. The disposal sites in Ocoya and South Streator began operation before there were comprehensive rules and regulations about waste disposal. The owners of the other three sites voluntarily agreed to resolve contamination problems caused on their property.

**Probability of occurrence:** Awareness of the dangers posed by indifferent material and waste handling has increased across virtually all sectors of American society. This awareness has prompted environmental and occupational regulations on how waste is handled from its generation through disposal. This awareness extends to how petroleum and petroleum based substances are stored. Changes in underground tank storage practices are expected to substantially reduce the number of problems with leaking tanks. Consequently, substantial increases in the number of sites needing remediation in either regulatory program are not expected. The probability of new sites needing remediation in Livingston County should be relatively low.

## 2.10 Summary – Impact of the Hazards

The impacts of the hazards are summarized according to the four major concerns:

- Health and safety,
- Damage to buildings,
- Damage to critical facilities, and
- Economic impact

After the conclusion of the hazard assessments and vulnerability assessments of the priority hazards (Table 2-3), the Planning Committee discussed the findings in order to determine the overall impact the hazard has on the County and the communities. The hazards and their impact are shown in Table 2-28, “Summary of the Hazards,” and they are in order of the overall impact to Livingston County.

The different columns on the table represent the following:

Annual Chance or Frequency: The "Annual Chance" column in the table shows the likelihood of occurrence in any given year. These numbers are discussed in the "Frequency" section of each hazard.

Location: The location and area affected by a single occurrence is shown.

Impact on Property: The vulnerability of structural damage to buildings or other property damage.

Value of vulnerable property: Property damage exposure is the computed dollar amount from the vulnerability analysis.

Critical Facilities: The types of critical facilities and infrastructure that are affected are listed.

Impact on People: This category relates to health and safety hazards. Ratings of high, medium, or low are shown.

Economic Impact: Typical impacts on businesses and utilities are listed in this column.

The County, all municipalities, other agencies and institutions involved in this Plan are exposed to all identified hazards. This is due to the relatively flat topography of the County, and due to the amount of urbanization and developed land. Flooding, for example, is not limited to floodplain areas.

**Table 2-28**  
**Summary of Livingston County Natural Hazards**

<b>Hazard</b>	<b>Annual Chance</b>	<b>Impact Location</b>	<b>Square miles Affected</b>	<b>Impact on Property</b>	<b>Value of Vulnerable Property</b>	<b>Impact on Critical Facilities</b>	<b>Impact on Health and Safety</b>	<b>Economic Impact</b>
<b>Floods</b>	1%	Floodplains	77.61	Moderate	\$100.5 million	Moderate	Moderate	Moderate
<b>Severe Summer Storms</b>	33%	Communities	1045	Moderate	\$1.08 billion	Moderate	Moderate	Moderate
<b>Severe Winter Storms</b>	100%	Countywide	1045	Low	\$1.08 billion	Low	Moderate	Moderate
<b>Tornado</b>	0.07%	Rural	5	High	\$1.78 million	Moderate	High	Moderate
	0.07%	Community	5	High	\$98.1 million	Moderate	High	Moderate
<b>Extreme Cold</b>	6.70%	Countywide	1045	Low	---	Low	High	Low
<b>Extreme Heat</b>	6.70%	Countywide	1045	Low	---	Low	High	Low
<b>Drought</b>	6.70%	Countywide	1045	Moderate	---	Low	High	Moderate
<b>Groundwater</b>	< 1%	Countywide	1045	Moderate	---	Low	High	Moderate

Table 2-29 shows the Livingston County hazard identification by community for the natural hazards evaluated in Table 2-28. The findings of the hazard analysis and profile of Chapter 2 and the vulnerability assessment were used as the foundation of goals and guidelines and mitigation activities developed in Chapter 4 though 8.

**Table 2-29**  
**Livingston County Hazard Identification by Community for Natural Hazards**

<b>Community</b>	<b>Flood</b>	<b>Severe Summer Storms</b>	<b>Winter Storms</b>	<b>Tornado</b>	<b>Extreme Heat</b>	<b>Extreme Cold</b>
Village of Campus*		X	X	X	X	X
Village of Chatsworth*		X	X	X	X	X
Village of Cornell*		X	X	X	X	X
Village of Cullom*		X	X	X	X	X
Village of Dwight	X	X	X	X	X	X
Village of Emington*		X	X	X	X	X
City of Fairbury	X	X	X	X	X	X
Village of Flanagan*		X	X	X	X	X
Village of Forrest	X	X	X	X	X	X
Village of Long Point	X	X	X	X	X	X
Village of Odell*		X	X	X	X	X
City of Pontiac	X	X	X	X	X	X
Village of Saunemin	X	X	X	X	X	X
Village of Strawn*		X	X	X	X	X
Unincorp. Livingston Co.	X	X	X	X	X	X

\* No FEMA mapped floodplain areas.

Note that communities shown not to have a "flood" hazard are still subject to localized or stormwater flooding that can occur with severe storms. Also note that all communities are subject to the manmade hazards discussed in this chapter.

**Comparison to State of Illinois 2007 Natural Hazard Mitigation Plan:** The 2007 Illinois Natural Hazard Mitigation Plan prepared by the Illinois Emergency Management Agency (IEMA) hazard rating system has five levels: low, guarded, elevated, high and severe. Livingston County's hazard ratings for identified natural hazards are in the 2007 Plan are shown in Table 2-30.

**Table 2-30**  
**IEMA Hazard Ratings for Livingston County**

<b>Hazard:</b>	<b>IEMA Rating</b>
<b>Floods</b>	Guarded
<b>Severe Summer Storms</b>	Severe
<b>Severe Winter Storms</b>	Severe
<b>Tornado</b>	Elevated
<b>Extreme Heat</b>	Elevated
<b>Drought</b>	Guarded
<b>Earthquake</b>	Elevated

The findings of this risk assessment are consistent with the ratings presented in the State's plan. With the occurrence of the June 2010 tornado, however, this Plan places additional emphasis on tornado and high wind mitigation. The State mitigation plan is currently being updated.



## 2.11 Conclusions:

1. Livingston County is a predominately rural county with a population center in Pontiac. Total property value of the County is estimated to be over \$1.9 billion.
2. Livingston County is part of three major watersheds in Illinois. There exists similar topography and soils throughout County.
3. All communities and agencies involved in this Plan share the same vulnerability to natural hazards, except for riverine flooding. Dwight, Fairbury, Forrest, Pontiac and Reading Township, along with unincorporated areas of the County, are subject to flooding.
4. The priority natural hazards identified by the Mitigation Planning Committee are floods, severe summer storms, severe winter storms, tornadoes, and extreme heat and extreme cold events
5. The priority manmade hazards identified by the Mitigation Planning Committee are transportation incidents, radiological release, utility disruptions, and hazardous material incidents.
6. Identification and analysis of natural hazards is consistent with the State's *2007 Natural Hazard Mitigation Plan*.
7. Floods have the highest impact on property and have the highest potential for economic impact.
8. Tornadoes have a high potential impact on both property damage and loss of life.

## 2.12 References

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24. Illinois Commerce Commission Annual Reports on "Accidents/Incidents involving Hazardous Materials on Railroads in Illinois", 2000 through 2009 reports.
25. Survey of Livingston County municipalities, 2010.

## Chapter 3. Goals

The goals for this *All Hazards Mitigation Plan* were developed during the Mitigation Planning Committee's May and June 2010 meetings. The goals were developed to reflect current community priorities, to be appropriate with the natural hazards that impact Livingston County, and to be consistent with other planning efforts. The goals and guidelines presented in this chapter are the foundation of the Action Plan, presented in Chapter 9.

### 3.1 Community Priorities

At the May 2010 meeting the Planning Committee members were given a handout listing various community priorities listed in alphabetical order. The handout asked: "What are the top five priorities for your community and Livingston County? What do your community leaders hold as most important?" Planning Committee members were asked not to answer these questions from their personal views, but to reflect the position of their city council, village board, or County Board.

The purpose of this exercise was to have the Planning Committee consider the direction or future of the County and municipalities before focusing on hazard mitigation goals and objectives. After each person ranked the priorities, the Committee ranked the community priorities as a whole:

- Improve/increase businesses and manufacturing.
- Improve employment opportunities.
- Provide a safe place to live and work.
- Improve schools and education programs.
- Improve and appropriately plan for growth.
- Preserve farmland.
- Improve infrastructure.

From the exercise, it can be concluded that the Planning Committee sees community priorities as those activities that improve the economy of Livingston County, but ensuring that growth in communities and populations is done through "smart growth." The Planning Committee also stressed improving the quality of life for people who currently live and work in Livingston County, including the protection of historic and cultural resources. For infrastructure, the Committee stressed improving roads, water supply and water quality.

### 3.2 Plan Direction

At the May 2010 meeting the Planning Committee conducted two more exercises to examine what the Plan should focus on, and how mitigation projects should be funded and implemented. Planning Committee members were given a list of possible responses to each of these questions, and then the group discussed the findings.

For the questions of "*What to focus on?*" the priorities were:

- Protecting critical facilities.
- Protecting people's and animals' lives.
- Protecting public health.
- Protecting public services.
- Protect streets and utilities.
- Give special attention to elderly/disabled.
- Protecting wetland/natural areas.
- Protecting existing and future development.

For the question of “How should mitigation projects be funded and implemented?” the responses were as follows:

- Make people aware of the hazards they face.
- Make people aware of how they can protect themselves.
- Protect life/safety regardless of the cost.
- Protect critical facilities regardless of the cost.
- Use county/municipal agencies to implement mitigation activities.
- Develop public-private partnerships.
- Fund projects where it’s proven that the benefits exceed the costs.
- Seek user fees to fund measures.
- Select projects that state/federal agencies will fund.

The Planning Committee felt that people should be aware of how to help themselves, and the County and municipalities should take an active role in this effort. The Planning Committee felt that the County and municipalities should implement mitigation projects; however, state and federal agency funding is critical and should be sought.

The need for partnerships is important in addressing natural hazards, but more important for addressing the manmade hazards discussed in Chapter 2, since manmade hazards can be the results natural hazards but also non-weather related incidents and accidents.

### 3.3 Goals and Guidelines

At the June 2010 meeting the Planning Committee established the goals for this *Livingston County All Hazards Mitigation Plan* as:

- Goal 1. Protect the lives, health, and safety of the people of Livingston County from the impact and effects of natural and manmade hazards.
- Goal 2. Protect public services and critical facilities from loss of use during, and potential damage from, natural and manmade hazard events.
- Goal 3. Mitigate to protect against economic and transportation losses due to natural and manmade hazards.
- Goal 4. Ensure that new developments do not create new exposures to damage from natural and manmade hazards.
- Goal 5. Identify specific projects to protect lives and mitigate damage where cost-effective and affordable.
- Goal 6. Protect historic, cultural, and natural resources from the effects of natural and manmade hazards.

The following guidelines were developed by the Planning Committee for purpose of achieving the goals and to facilitate the development of hazard mitigation action items in Chapter 9:

- Guideline 1. Focus natural hazards mitigation efforts on floods, tornadoes, severe summer storms, severe winter storms, and extreme cold and heat events.
- Guideline 2. Focus manmade hazard mitigation efforts on utility interruption, transportation related incidents, hazardous material incidents and radiological release incidents.
- Guideline 3. Make people aware of the hazards they face and focus mitigation efforts on measures that allow residents and property owners to help themselves.
- Guideline 4. Create and foster public-private partnerships to accomplish mitigation activities.
- Guideline 5. Seek state, and federal support for mitigation efforts.
- Guideline 6. Use available local funds, when necessary, to protect the public services, critical facilities, lives, health, and safety from natural and manmade hazards.
- Guideline 7. Strive to improve and expand business, infrastructure, education and housing opportunities in Livingston County in conjunction with planned mitigation efforts.

In summary, the goals and guidelines of this Plan focus on the life, health, and safety issues associated with natural hazards, and on the importance of people being able to protect themselves and their property from damage.

### **3.4 County and Municipal Planning Goals**

A review of the goals and guidelines of this Plan were compared to the goals of other available County and municipal plans. That review showed that this Plan's focus is consistent and complementary to current County and municipal initiatives included in their comprehensive and other plans.

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## Chapter 4. Preventive Measures

FEMA defines hazard mitigation as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Preventive mitigation measures are intended to protect new construction from natural and manmade hazards and to help ensure new development does not increase potential losses for communities. Preventive measures discussed in this chapter also include activities to protect natural resources. They include the following:

- Building Codes
- Standards for Manufactured Homes
- Planning and Zoning
- Subdivision Regulations
- Stormwater Management
- Natural and Beneficial Function Preservation
- Erosion Control and Best Management Practices
- Dumping Ordinances
- Urban Forestry
- Hazard Mapping
- Historic Site Protection
- Community Rating System



### 4.1 Building Codes

Building codes provide one of the best methods of addressing natural hazard mitigation. They are an important measure to protecting new property from damage by tornadoes, high winds, snow storms, and earthquakes,. When properly designed and constructed according to code, the average building can withstand the impacts of most of these forces.

Hazard protection standards for all new and improved or repaired buildings can be incorporated into the local building code. Provisions that should be included are:

- Making sure roofing systems will handle high winds and expected snow loads,
- Providing special standards for tying the roof, walls and foundation together to resist the effects of wind (see illustration),
- Requiring new buildings to have tornado "safe rooms,"
- Including insulation standards that ensure protection from extreme heat and cold as well as energy efficiency,
- Regulating overhanging masonry elements that can fall during an earthquake,

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

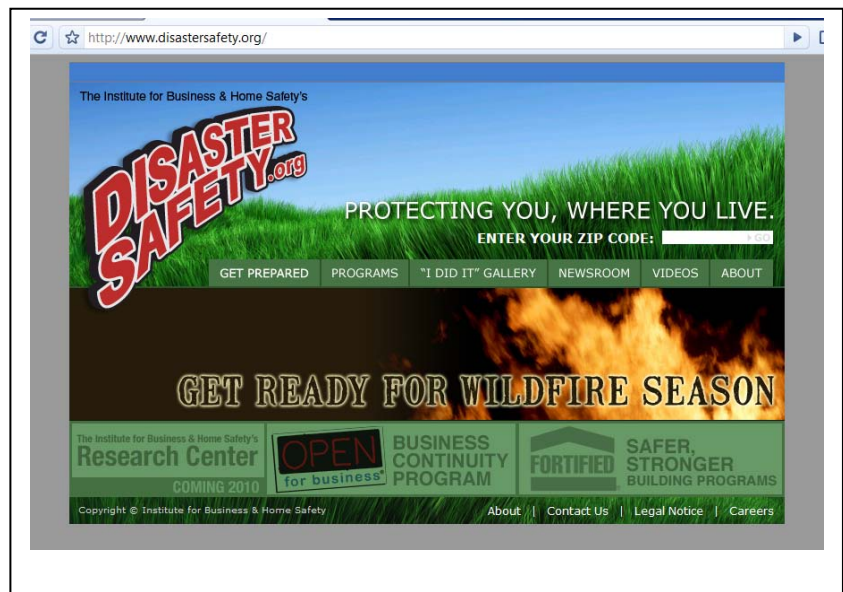


- Ensuring that foundations are strong enough for earth movement and that all structural elements are properly connected to the foundation, and
- Mandating overhead sewers for all new basements to prevent sewer backup.

**Model codes:** The predominant model building codes being adopted by communities are the International Code series (I-Codes), including the International Residential Code (IRC) and the International Building Code (IBC). The most recent version of these codes is 2009.

**Flood Standards:** The I-Codes have a section on flood protection that communities must adopt separately. These standards are in addition to requirements of the National Flood Insurance Program that are adopted in a community's floodplain ordinance.

**Protected Homes:** The Institute for Business and Home Safety (IBHS) has a set of recommendations to strengthen a building to better resist the impacts of natural hazards. The specific requirements for a protected or a "Fortified" home are available through the IBHS website at [www.disastersafety.org](http://www.disastersafety.org) (see next page). On the web site, a postal code (zip code) can be entered and regional recommendations are made for maintenance, new construction and businesses.



New construction should also include the construction of an underground shelter or "safe room" at the first floor level to protect the lives of the occupants. A building code could require them in new construction. Tornado safe rooms are discussed further in Section 5.2.2.

**Code Administration:** Enforcement of code standards is very important. Adequate inspections are needed during the course of construction to ensure that the builder understands and implements the requirements. The Building Code Effectiveness Grading Schedule (BCEGS) is a national program used by the insurance industry to determine how well new construction is protected from wind, earthquake and other non-flood hazards. The BCEGS is similar to the National Flood Insurance Program (NFIP) Community Rating System and the century-old fire insurance rating scheme. With BCEGS, building permit programs are reviewed and scored, a Class 1 community is the best, and a Class 10 community has little or no program.

**Code Official Training:** Training of code officials is also very important for code enforcement. Training of code officials and inspectors is a large part of the BCEGS rating for a community. Courses are offered through the building code associations to help local officials understand standards that apply to seismic, wind and flood hazards.

**Local Implementation:** Table 4-1 below lists the building codes in use in Livingston County.

**Table 4-1**  
**Livingston County Communities with Adopted Building Codes**

Village of Dwight	Village of Odell
Village of Emington*	City of Pontiac
City of Fairbury	Village of Saunemin*

\* for certain types of development

Commercial property: After July 1, 2011, Illinois law (20 ILCS3105/10.09-1) will require the I-Codes and the National Electric Code be applied to all commercial buildings in "non-building code jurisdictions". This means that counties and/or municipalities that have not adopted building codes for the community by ordinance. This includes Livingston County and municipalities not listed in Table 4-1. Commercial buildings are defined as any building other than a single-family home or a dwelling containing two or fewer apartments, condominiums, or townhomes or a farm building exempted by the Illinois Architecture Practice Act. This State commercial building code will be implemented by the Illinois Capital Development Board (CDB).

State property: Construction of state buildings and some other government buildings is exempt from municipal or county regulations. The CDB is the construction management agency for state projects, such as prisons, college and university classroom buildings, mental health hospitals and state parks.

## 4.2 Manufactured Homes

Manufactured or "mobile" homes are usually not regulated by local building codes. They are built in a factory in another state and are shipped to a site. They do have



to meet construction standards set by the US Department of Housing and Urban Development (HUD). All mobile type homes constructed after June 15, 1976, must comply with HUD's National Manufactured Home Construction and Safety Standards. These standards apply uniformly across the country and it is illegal for a local unit of government to require additional construction requirements. Local jurisdictions may regulate the location to these structures and their on-site installation.

The greatest mitigation concern with manufactured housing is protection from damage by wind. The key to local mitigation of wind damage to mobile homes is their installation. The Illinois Mobile Home Act and Manufactured

Home Tiedown Code are enforced by the Illinois Department of Public Health (IDPH). The State code includes equipment and installation standards. Installation must be done in accordance with manufacturers' specifications. There is a voluntary program for installers to be trained and certified.

Following the installation of a manufactured home, installers must send the state a certification that they have complied with the State's tiedown code. Inspections are only done if complaints are made regarding an installation. In addition to code standards to protect the mobile home from high winds is the need to protect the occupants. There are no state or federal requirements for shelters in mobile home parks. Mobile school classrooms are regulated by the IDPH, and school districts must provide the State with an architect's seal of compliance. Each year, there must be an inspection of the anchoring and a renewed evacuation plan signed by

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

the superintendent of the school district. These provisions provide a higher level of protection than current procedures do for residential mobile homes.

**Local Implementation:** As discussed in Chapter 2, there are seven manufactured home communities in Livingston County, one in Dwight, one in Fairbury, four in Pontiac and one in unincorporated South Streator (Reading Township). Though not located in recognized manufactured home communities, manufactured housing can be found as housing development throughout the incorporated and unincorporated areas of Livingston County. And as discussed in Chapter 2, a mobile home community in Dwight was destroyed following the June 2010 tornado that impacted the Village and the County. Floodplain ordinances, and required by FEMA and IDNR, apply to mobile homes and manufactured buildings. Zoning ordinances should have mobile home standards incorporated into them. The Village of Dwight is considering additional mobile home safety regulations.

### 4.3 Planning and Zoning

Building codes provide guidance on how to build in hazardous areas. Planning and zoning activities direct development away from these areas, especially floodplains and wetlands. They do this by designating land uses that are more compatible to the natural conditions of the land, such as open space or recreation. They can also benefit by simply allowing developers more flexibility in arranging improvements on a parcel of land through the planned development approach.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

**Comprehensive Plans:** These plans are the primary tools used by communities to address future development. They can reduce future flood related damages by indicating open space or low density development within floodplains and other hazardous areas. Unfortunately, natural hazards are not always emphasized or considered in the specific land use recommendations.

**Zoning Regulations:** A zoning ordinance regulates development by dividing a community into zones or districts and setting development criteria for each zone or district. Zoning codes are considered the primary tool to implement a comprehensive plan's guidelines for how land should be developed.

Zoning ordinances usually set minimum lot sizes for each zoning district. Often, developers will produce a standard grid layout, and the ordinance and the community can allow flexibility in lot sizes and location so developers can avoid hazardous areas.

One way to encourage such flexibility is to use the planned unit development (PUD) approach. The PUD approach allows the developer to easily incorporate flood hazard mitigation measures into the project. Open space and/or floodplain preservation can be facilitated and site designs standards and land use densities can be adjusted.

**Capital Improvement Plans:** A capital improvement plan will guide a community's major public expenditures for the next 5 to 20 years. Capital expenditures may include acquisition of open space within the hazardous areas, extension of public services into hazardous areas, or retrofitting existing public structures to withstand a hazard.

**Local implementation:** Table 4-2 summarizes the findings of a review of comprehensive and land use plans adopted by the County and the municipalities.

**Table 4-2 Livingston County Planning and Land Use Ordinances**

<b>Community</b>	<b>Comprehensive Plan</b>	<b>Zoning Ordinance</b>	<b>Subdivision Ordinance</b>
Village of Campus		County	
Village of Chatsworth		Yes	
Village of Cornell		Yes	
Village of Cullom		Yes	
Village of Dwight	Yes	Yes	Yes
Village of Emington		Yes	
City of Fairbury	Yes	Yes	Yes
Village of Flanagan		Yes	
Village of Forrest		Yes	
Village of Long Point		County	
Village of Odell	Yes	Yes	Yes
City of Pontiac	Yes	Yes	Yes
Village of Saunemin		County	
Village of Strawn		County	
Reading Township	Yes*	County	
Livingston County	Yes	Yes	Yes

\*Adoption Pending

## 4.4 Subdivision Regulations

Subdivision regulations govern how land will be subdivided and sets construction standards. These standards generally address roads, sidewalks, utilities, storm sewers and drainageways. They can include the following hazard protection standards:

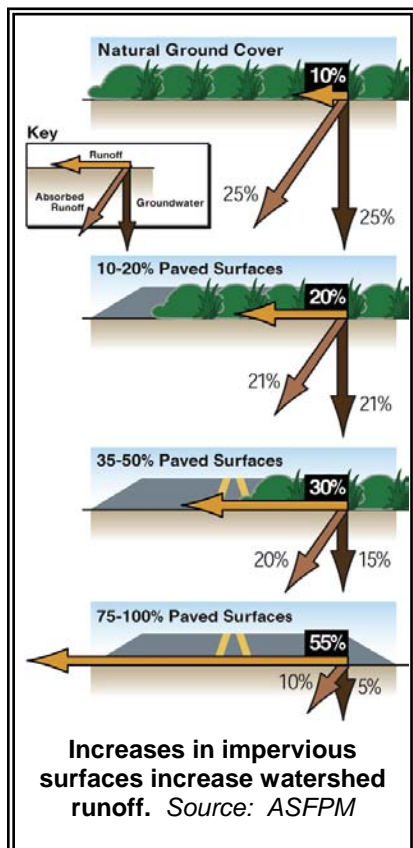
- Requiring that the final plat show all hazardous areas.
- Road standards that allow passage of fire fighting equipment and snow plows
- Requiring power or phone lines to be buried
- Minimum water pressures adequate for fire fighting
- Requiring that each lot be provided with a building site above the flood level
- Requiring that all roadways be no more than one foot below the flood elevation.

<b>Hazards Addressed</b>	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

**Local implementation:** Table 4-2 shows the communities in Livingston County that have adopted subdivision regulations.

## 4.5 Stormwater Management

Development in floodplains is development in harm's way. New construction in the floodplain increases the amount of development exposed to damage and can aggravate flooding on neighboring properties.



Development outside a floodplain can also contribute to flooding problems. Stormwater runoff is increased when natural ground cover is replaced by urban development (see graphic). Development in the watershed that drains to a river can aggravate downstream flooding, overload the community's drainage system, cause erosion, and impair water quality.

Stormwater management encompasses two approaches to protecting new construction from damage by surface water:

- Regulating development in the floodplain to ensure that it will be protected from flooding and that it won't divert floodwaters onto other properties, and
- Regulating all development to ensure that the post-development peak runoff will not be greater than under pre-development conditions.

Most communities participate in the National Flood Insurance Program (NFIP). The NFIP and the Illinois Department of Natural Resources set minimum requirements for regulating development in the floodplain. All new buildings must be protected from the base or 100-year flood and no development can cause an increase in flood heights or velocities.

Stormwater runoff regulations require developers to build retention or detention basins to minimize the increases in the runoff rate caused by impervious surfaces and new drainage systems. Generally, each development must not let stormwater leave at a rate higher than that under pre-development conditions.

**Local implementation:** The Livingston County and community NFIP ordinances meet or exceed all of the state and NFIP floodplain regulatory requirements. FEMA and the Illinois Department of Natural Resources (IDNR) periodically visit or contact communities to verify that staff understand and are enforcing the floodplain regulations. According to IDNR, communities were found to be generally good during recent contacts and visits for administration or enforcement of the floodplain ordinances. Reading Township has developed sewer and stormwater management plans, and the sewer systems are being constructed with a completion date expected in 2011.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

## 4.6 Natural and Beneficial Function Preservation

The objective of the protection of an ecosystem's natural and beneficial function is to preserve, or in some cases restore, natural areas. Protection activities enable the naturally beneficial functions of the land, such as, fields, floodplains or wetlands, to be better realized. Natural and beneficial functions of watersheds, floodplains and wetlands include the following:

- Reduction in runoff from rainwater and snow melt in pervious areas
- Infiltration that absorbs overland flood flow
- Removal and filtering of excess nutrients, pollutants, and sediments
- Storage of floodwaters
- Absorption of flood energy and reduction in flood scour
- Water quality improvement
- Groundwater recharge
- Habitat for flora and fauna
- Recreational and aesthetic opportunities

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

As development occurs, many of the above benefits can be achieved through regulatory steps for protecting natural areas or natural functions.

Keeping the floodplain and other hazardous areas open and free from development is the best approach to preventing damage to new developments. Open space can be maintained in agricultural use or can serve as parks, greenway corridors and golf courses.

Capital improvement plans and comprehensive land use plans can identify areas to be preserved through any or all of the following means:

- Acquisition,
- Dedication by developers,
- Dedicating or purchasing an easement to keep the land open,
- Specifying setbacks or buffer zones where development is not allowed, and
- Subdivision regulations need to ensure that streets and other public facilities can handle emergency vehicles during an emergency.

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flows. They also serve as a natural filter, which helps to improve water quality, and provide habitat for many species of fish, wildlife, and plants. A 1993 study by the Illinois State Water Survey concluded that for every one percent increase in protected wetlands along a stream corridor, peak stream flows decreased by 3.7 percent.

Wetlands that are determined to be part of the waters of the United States are regulated by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency (USEPA) under Section 404 of the Clean Water Act. Before a "404" permit is issued, the plans are reviewed by several agencies, including the Corps and the U.S. Fish and Wildlife Service. Each of these agencies must sign off on individual permits.

There are also nationwide permits that allow small projects that meet certain criteria to proceed without individual permits. Wetlands not included in the Corps' jurisdiction or that are addressed by a nationwide permit may be regulated by local authorities.

If a permit is issued by the Corps, the impact of the development is typically required to be mitigated. Wetland mitigation can include creation, restoration, enhancement or preservation of wetlands elsewhere. Wetland mitigation is often accomplished within the development site, however, mitigation is allowed off-site and sometimes in another watershed. The appropriate type of mitigation is addressed in each permit.

Some developers and government agencies have accomplished the required mitigation by buying into a wetland bank. Wetland banks are large wetlands created for the purpose of mitigation. The banks accept money to reimburse the owner for setting the land aside from development.

When a wetland is mitigated at another site there are drawbacks to consider. First, it takes many years for a new wetland to approach the same quality as an existing one. Second, a new wetland in a different location (especially if it's in a different watershed) will not have the same flood damage reduction benefits as the original one did.

**Local implementation:** The Vermilion River Watershed Task Force is working to protect natural and beneficial functions of the Vermilion River watershed. With funding from IDNR, the Task Force and other stakeholders have developed publications to help educate property owners on the importance of wildlife habitat, water quality and other watershed issues.

Wetlands in Livingston County are subject to the Section 404 regulations, which are implemented by the Corps of Engineers, where applicable. Wetlands within agricultural land that have farm subsidies are under the responsibility of the Natural Resources Conservation Service.

## 4.7 Erosion Control and Best Management Practices

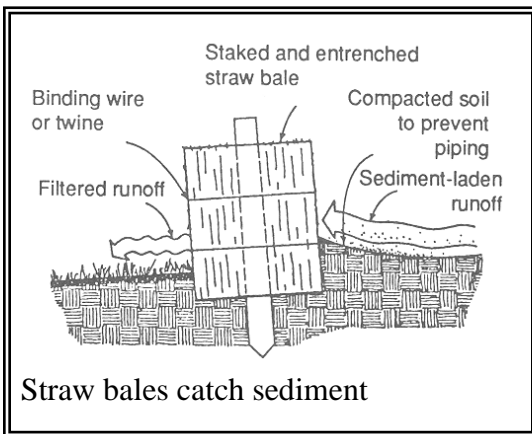
Farmlands and construction sites typically contain large areas of bare exposed soil. Surface water runoff can erode soil from these sites, sending sediment into downstream waterways. Erosion also occurs along streambanks and shorelines as the volume and velocity of flow or wave action destabilize and wash away the soil.

Sediment suspended in the water tends to settle out where flowing water slows down. It can clog storm sewers, drain tiles, culverts and ditches and reduce the water transport and storage capacity of river and stream channels, lakes and wetlands. When channels are constricted and flooding cannot deposit sediment in the bottomlands, even more is left in the channels. The result is either clogged streams or increased dredging costs.

Not only are the drainage channels less able to do their job, but the sediment in the water reduces light, oxygen, and water quality and often brings chemicals, heavy metals and other pollutants. Sediment has been identified by the US EPA as the nation's number one nonpoint source pollutant for aquatic life.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident



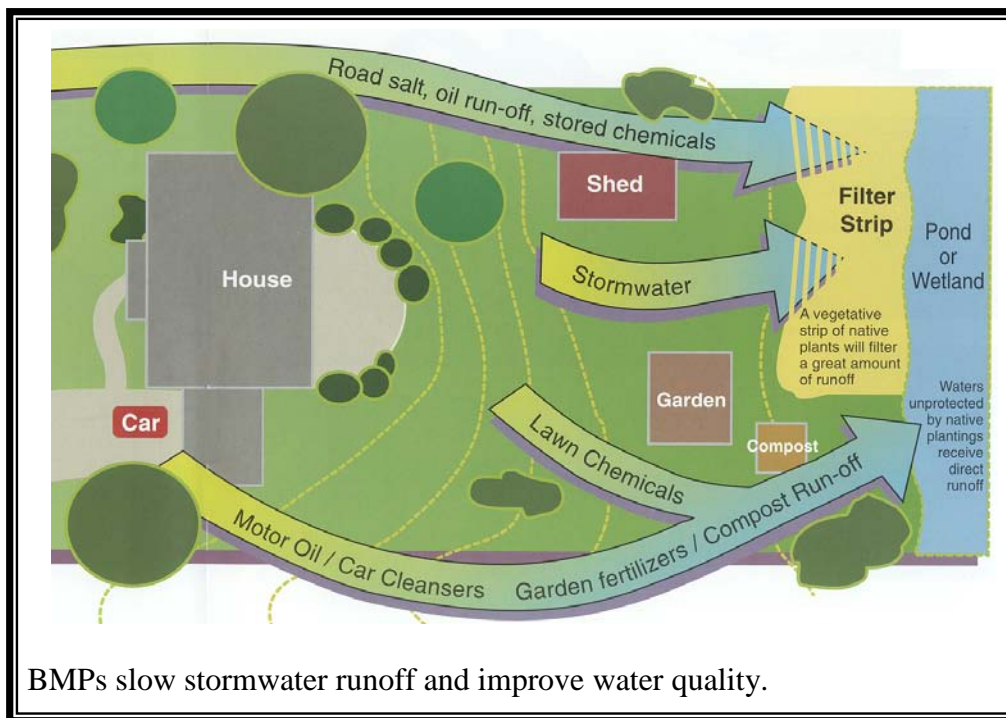


There are two principal strategies to address these problems: minimize erosion and control sedimentation. Techniques to minimize erosion include phased construction, minimal land clearing, and stabilizing bare ground as soon as possible with vegetation and other soil-stabilizing practices.

If erosion occurs, other measures are used to capture sediment before it leaves the site. Silt fences, sediment traps and vegetated filter strips are commonly used to control sediment transport. Runoff from the site can be slowed down by terraces, contour strip farming, no-till farm practices, hay or straw bales, constructed wetlands, and

impoundments (e.g., sediment basins and farm ponds). Slowing surface water runoff on the way to a drainage channel increases infiltration into the soil and reduces the volume of topsoil eroded from the site.

Erosion and sedimentation control regulations mandate that these types of practices be incorporated into construction plans. They are usually oriented toward construction sites rather than farms. The most common approach is to require applicants for permits to submit an erosion and sediment control plan for the construction project. This allows the applicant to determine the best practices for the site.



Point source pollutants come from pipes such as the outfall of a municipal wastewater treatment plant. They are regulated by the U.S. and Illinois Environmental Protection Agencies. Nonpoint source pollutants come from non-specific locations and are harder to regulate.

Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches and streams.



The term “best management practices” (BMPs) refers to design, construction and maintenance practices and criteria that minimize the impact of stormwater runoff rates and volumes, prevent erosion, protect natural resources and capture nonpoint source pollutants (including sediment). They can prevent increases in downstream flooding by attenuating runoff and enhancing infiltration of stormwater. They also minimize water quality degradation, preserve beneficial natural features onsite, maintain natural base flows, minimize habitat loss, and provide multiple use of drainage and storage facilities.

**Local implementation:** Best management practices are encouraged to meet the requirements of the Clean Water Act and the NPDES Phase II (National Pollutant Discharge Elimination System) requirements. The Vermilion River Watershed Task Force, with funding from IDNR, has undertaken an erosion control project along Indian Creek.

## 4.8 Dumping Regulations

BMPs usually address pollutants that are liquids or suspended in water that are washed into a lake or stream. Dumping regulations address solid matter, such as shopping carts, appliances and landscape waste that can be accidentally or intentionally thrown into channels or wetlands. Such materials may not pollute the water, but they can obstruct even low flows and reduce the channels’ and wetlands’ ability to convey or clean stormwater.

Many cities have nuisance ordinances that prohibit dumping garbage or other “objectionable waste” on public or private property. Waterway dumping regulations need to also apply to “nonobjectionable” materials, such as grass clippings or tree branches which can kill ground cover or cause obstructions in channels. Regular inspections to catch violations should be scheduled.

Many people do not realize the consequences of their actions. They may, for example, fill in the ditch in their front yard not realizing that it is needed to drain street runoff. They may not understand how regrading their yard, filling a wetland, or discarding leaves or branches in a watercourse can cause a problem to themselves and others. Therefore, a dumping enforcement program should include public information materials that explain the reasons for the rules as well as the penalties.

**Local implementation:** Some communities, including Dwight, Emington and Reading Township have ordinances that prohibit the dumping of debris in or obstructing waterways.

## 4.9 Urban Forestry

The majority of damage caused by wind, ice and snow storms is to trees. Downed trees and branches break utility lines and damage buildings, parked vehicles and anything else that was under them. A forestry program (urban or rural) can reduce the damage potential of trees. The cities in central Illinois are most prone to ice storms and have initiated programs that select species that are resistant to ice and storm damage.

Urban foresters or arborists can select hardier trees which can better withstand high wind and ice accumulation. Only trees that attain a height less than the utility lines should be allowed along the power and telephone line rights-of-way. Just as important as planting the right trees is correct pruning after a storm. If not done right, the damaged tree will not heal properly, decay over the next few years, and cause a hazard in the future. A trained person should review every damaged tree to determine if it should be pruned or removed.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
Y	Utility Interruption
	Other Manmade Incident



Trees are the first victims of ice storms.

By having stronger trees, programs of proper pruning, and on-going evaluation of the trees, communities can prevent serious damage to their tree population. A properly written and enforced urban forestry plan can reduce liability, alleviate the extent of fallen trees and limbs caused by wind and ice build-up, and provide guidance on repairs and pruning after a storm. Such a plan helps a community qualify to be a Tree City USA.

**Local Implementation:** No Livingston County communities currently participate in Tree City USA.

## 4.10 Hazard Mapping

Mapping of hazards, both the areas impacted and the severity of the hazard, is an important tool and resource for preventing damages from natural and manmade hazards. Communities in the NFIP have the riverine flood hazard mapped on their Flood Insurance Rate Map (FIRM). However, additional maps of other areas that experience or can potentially flood are very useful.

With the availability of the internet and mapping software tools, both hazards and their potential impact to buildings and infrastructure can be mapped. As communities build GIS mapping capabilities, layers for hazard data can be added as information becomes available.

**Local implementation:** As the need arises, and data becomes available, other hazards can be mapped through Livingston County's GIS program.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
Y	Radiological Incident
	Utility Interruption
Y	Other Manmade Incident



Pontiac, Illinois

## 4.11 Historic Site Protection

Livingston County is rich in historic resources. Table 4-3 shows surviving historic bridges in Livingston County, and Table 4--4 provides a list of Livingston County's historic sites. The historic sites are vulnerable to hazards. It is difficult to protect the structures from hazards due to their historic nature. Therefore, they should be considered should any mitigation opportunities be presented.

**Table 4-3 Livingston County Historic Bridges**

Mud Creek Bridge (c. 1901)
North Creek Old US 66 Bridge (c. 1926)
North Fork Bridge (c. 1910)
Scattering Point Creek Bridge (c. 1901)
Short Point Creek Bridge (c. 1901)

**Table 4-4**  
**National Historic Landmarks in Livingston County**

Landmark	Location	Community
Ambler's Texaco Gas Station	Il 17 and Old US 66	Dwight
Thomas A. Beach House	402 E. Hickory St.	Fairbury
Dwight Alton Railroad Depot	119 W. Main St.	Dwight
Fairbury City Hall	101 E. Locust St.	Fairbury
Illinois State Police Office, Pontiac	15551 Old US 66	Pontiac
Jones House	314 E. Madison St.	Pontiac
Livingston County Courthouse	112 W. Madison	Pontiac
John R. Oughton House	101 W. South St.	Dwight
Pioneer Gothic Church	201 N. Franklin St.	Dwight
Pontiac City Hall and Fire Station	110 W. Howard St.	Pontiac
Route 66, Cayuga to Chenoa		Pontiac
Raymond Schulz Round Barn	S of Pontiac off US 66	Pontiac
Standard Oil Gasoline Station	400 S. West St.	Odell

## 4.12 Community Rating System

The Federal Emergency Management Agency (FEMA) created the National Flood Insurance Program's (NFIP) Community Rating System (CRS) in 1990. It is designed to recognize floodplain management and other watershed management activities that go beyond NFIP minimum requirements. Communities that participate in the NFIP can apply for the CRS. When appropriate applications and reviews are completed, a community is awarded a CRS class rating. Residents and property owners of that community then qualify for a flood insurance premium rate reduction that ranges from 5 to 45 percent.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

CRS credit is provided for 18 creditable activities, organized under four categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Flood Preparedness

Numerous watershed and floodplain management activities in Illinois exceed the minimum NFIP requirements. Floodplain ordinances for communities in northeastern Illinois already exceed NFIP minimum requirements by virtue of the Illinois Department of Natural Resources-Office of Water Resources (IDNR-OWR) floodway rules (17 Ill. Admin. Code, Part 3708).

The CRS is a voluntary program and is modeled after the fire insurance rating system. Insurance premiums are adjusted based on the rating of the community. The CRS class rating and premium reductions are shown in the table below. Properties in the FEMA Special Flood Hazard Areas (SFHAs), or the 100-year floodplain, receive a 5 percent premium reduction for every improvement in the CRS class. Properties outside the SFHA already have a reduced premium (since they are outside the floodplain), and therefore have a lower premium reduction than properties in the SFHA.

Class	CRS	Premium Reduction	
	Credit Points	SFHA*	Non-SFHA
1	4,500+	45%	10%
2	4,000 – 4,499	40%	10%
3	3,500 – 3,999	35%	10%
4	3,000 – 3,499	30%	10%
5	2,500 – 2,999	25%	10%
6	2,000 – 2,499	20%	10%
7	1,500 – 1,999	15%	5%
8	1,000 – 1,499	10%	5%
9	500 – 999	5%	5%
10	0 – 499	0	0

\*SFHA = Special Flood Hazard Area

Credit points are then earned from the following categories, listed by activity number:

**Public Information**

- 310 Elevation Certificates
- 320 Map Information
- 330 Outreach Projects
- 340 Hazard Disclosure
- 350 Flood Protection Library
- 360 Flood Protection Assistance

**Mapping and Regulations**

- 410 Additional Flood Data
- 420 Open Space Regulation
- 430 Higher Regulatory Standards
- 440 Flood Data Maintenance
- 450 Stormwater Management

**Flood Damage Reduction**

- 510 Floodplain Management Planning
- 520 Acquisition and Relocation
- 530 Retrofitting
- 540 Drainage System Maintenance

**Flood Preparedness Activities**

- 610 Flood Warning Program
- 620 Levee Safety
- 630 Dam Safety

Communities must meet two prerequisites in order to apply for a Class 9: 1) participate in the NFIP, and 2) be in "good standing" with the NFIP. Communities must also do certain required CRS activities to be a Class 9 or better, including:

- Appoint a CRS coordinator
- Maintain elevation certificates for floodplain buildings constructed after the application date
- Evaluate repetitive loss properties
- Ensure that public buildings in the floodplain are insured

Communities must meet two prerequisites in order to apply for a Class 9: 1) participate in the NFIP, and 2) be in "good standing" with the NFIP. Communities must also do certain required CRS activities to be a Class 9 or better, including:

- Appoint a CRS coordinator
- Maintain elevation certificates for floodplain buildings constructed after the application date
- Evaluate repetitive loss properties
- Ensure that public buildings in the floodplain are insured

## **4.13 Conclusions**

1. Building codes are an important mitigation measure that help prevent damage to new buildings that can occur due to tornadoes, high winds, snow storms, and earthquakes. Building codes also protect lives.
2. Six municipalities (Table 4-1) have adopted building codes in Livingston County.
3. Comprehensive and land use plans should to address floodplains and the need to preserve these hazardous areas from intensive development. Zoning ordinances should designate flood prone areas as a special type of land use.
4. Standards in subdivision regulations for public facilities should account for the natural and manmade hazards present at, or near, the site.
5. Mobile home or manufactured home communities are extremely vulnerable to natural hazards. State administration of installation of mobile or manufactured homes does not guarantee that they will be adequately tied down or protected from flooding and other hazards. Livingston County has manufactured homes that are vulnerable to flood and wind events.
6. Critical facilities are also vulnerable to natural and manmade hazards and should be protected.
7. Protecting water quality in Livingston County is important and can be addressed through preventive measures.

## **4.14 Recommendations**

1. As the County and municipalities develop or revise comprehensive or land use plans, emergency operations plans, and ordinances, the goals and guidelines of this Plan should be incorporated into those efforts.
2. Communities that do not currently implement building codes for new construction should consider adopting the International Codes series. Communities that do currently enforce building codes should consider if

residential and commercial code revisions should be pursued to strengthen new buildings against damage by high winds, tornadoes hail, and earthquakes.

3. Safety-related requirements for manufactured (mobile) home communities and for the placement of manufactured homes should be developed, including the requirement for the construction of a saferoom/shelter for mobile home communities, and full enforcement of the Illinois Mobile Home Act and the Manufactured Home Tiedown Code managed by the Illinois Department of Public Health for all mobile homes.
4. Offices responsible for design, construction or permitting of critical facilities, including federal, state, county and municipal agencies, should ensure that the design or modification of critical facilities accounts for natural and manmade hazards and adjacent land uses.
5. Requiring tornado safe rooms in certain structures should be considered by all communities, especially with the development of senior living facilities, child care centers and schools.
6. Additional training for building department staff on building code administration, enforcement, the natural hazards aspects of the International Codes, regulation of mobile home installation, floodplain ordinances, should also be considered.
7. County, municipal staff, and consultants should be trained in building code administration and enforcement, and they should be trained on implementing the codes that are applicable to natural and manmade hazard mitigation.
8. Municipalities that participate in the National Flood Insurance Program (NFIP) should ensure that they are in full compliance with the NFIP administration and enforcement requirements.
9. On a regional basis, municipal and county staff should develop example subdivision ordinance language that requires new infrastructure to have hazard mitigation provisions, such as:
  - Streets and water systems that facilitate access and use by fire and emergency equipment
  - Buried utility lines
  - Storm shelters in new mobile home parks
10. The public, developers, builders, and decision makers should be informed about the hazard mitigation benefits of preventive measures and the procedures that should be followed to ensure that new developments do not create new problems.

## **4.15 References**

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2. Design and Construction Guidance for Community Shelters, FEMA, 2000.
3. Guidelines for Installing Manufactured Homes in Illinois, Illinois Department of Public Health, 2000.
4. Multi-Hazard Identification and Risk Assessment, Federal Emergency Management Agency, 1997.
5. Regulation of Factory Built Structures in Illinois, Illinois Department of Public Health, 2000.

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## Chapter 5. Property Protection

Property protection mitigation measures are used to modify a building or a property that is subject to a hazard in order to reduce potential damage. Property protection measures fall under the following approaches:

- Modify the site to keep the hazard from reaching the building
- Modify the building (retrofit the building) so it can withstand the impacts of the hazard
- Insure the property to provide financial relief after the damage occurs

The word “building” can refer to residential, commercial or industrial structures, or it can mean infrastructure facilities (treatment plants, electrical substations, roads) or other public structures. Property protection measures are normally implemented by the property owner (public or private), although in many cases technical and financial assistance can be provided by a government agency. These are discussed later in this chapter.

### 5.1 Barriers, Elevation, Relocation, and Acquisition

For the hazards considered in this plan, flooding is the one hazard that can be kept away from a building. There are four common methods to do this:

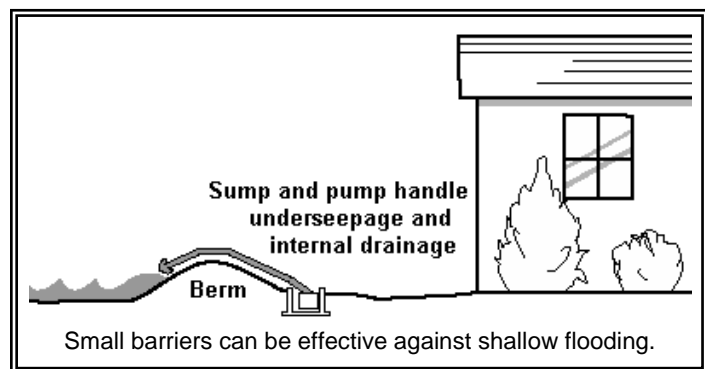
- Erect a barrier between the building and the source of flooding
- Move the building out of the flood prone area
- Elevate the building above the flood level
- Demolish the building

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

The advantages and disadvantages to these four methods will be discussed below. Generally, floods do not damage vacant areas. The major impact of hazards is to people and improved property. In some cases, properties can be modified so the hazard does not reach the damage-prone improvements. A fire break is an example of this approach – brush and other fuel are cleared away from the building so a fire may not reach it.

**Barriers:** A flood protection barrier can be built of dirt or soil (“berm”) or concrete or steel (“floodwall”). Berms take up more space than floodwalls, but floodwalls are more expensive than berms.

Careful design is needed so as not to create flooding or drainage problems on neighboring properties. If the ground is porous and if floodwaters will stay up for more than an hour or two, the design needs to account for leaks, seepage of water underneath, and rainwater that falls inside the perimeter.





Barriers can only be built so high. They can be overtopped by a flood higher than expected. Barriers made of earth are susceptible to erosion from rain and floodwaters if not properly sloped, covered with grass, and maintained. A berm can settle over time, lowering its protection level. A floodwall can crack, weaken, and lose its watertight seal. Therefore, barriers need careful design and maintenance (and insurance on the building, in case of failure).

**Relocation:** Moving a building to higher ground is the surest and safest way to protect it from flooding. Relocation of a building can be to a new property outside of the floodplain, or, for large lots, to a higher location (outside of the floodplain) on the existing property. Any building can be moved, however the cost goes up for heavier structures, such as those with exterior brick and stone walls, and for large or irregularly shaped buildings.

**Building Elevation:** Raising a building above the flood level can be almost as effective as moving it out of the floodplain. Water flows under the building, causing little or no damage to the structure or its contents.

Raising a building above the flood level is cheaper than moving it and can be less disruptive to a neighborhood. Elevation has proven to be an acceptable and reasonable means of complying with floodplain regulations that require new, substantially improved, and substantially damaged buildings to be elevated above the base flood elevation.

Elevating a building will change its appearance. If the required amount of elevation is low, the result is similar to putting a building on a 2- or 3-foot-high crawlspace (see example below). If the building needs to be raised more than four feet, owners are concerned that it will stick out like a sore thumb, and they may decline to implement an elevation project. Yet, many owners have successfully and attractively (with stairs and landscaping) elevated their homes more than eight feet.

Another problem with this approach is with basements. Only the first floor and higher are elevated. The basement remains as the foundation. All utilities are elevated and the basement is filled in to protect the walls from water pressure. The owner loses the use of the basement, which may deter him or her from trying this approach.

A third problem with elevation is that it may expose the structure to greater impacts from other hazards. If not braced and anchored properly, an elevated building may have less resistance to the shaking of an earthquake and the pressures of high winds. Careful design and construction, however, should prevent these secondary problems.

**Demolition:** If a home has been heavily damaged and susceptible to future damage, it is safest for owners to relocate. Acquisition, followed by demolition, is most appropriate for buildings that are dilapidated and are not worth protecting, but acquisition and demolition should also be considered for structures that would be difficult to move—such as larger, slab foundation, or masonry structures. Generally, demolition projects are undertaken by a government agency, so the cost is not borne by the property owner, and the land is converted to public use, such as a park.

One problem that sometimes results from an acquisition and demolition project is a “checkerboard” pattern in which nonadjacent properties are acquired. Creating such an acquisition pattern in a community adds to the maintenance costs that taxpayers must support.

**Local Implementation:** Following the 2008 flood, five homes were demolished in the County due to being substantially damaged from the flood.

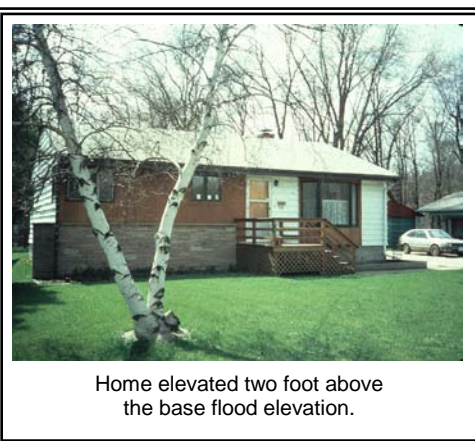
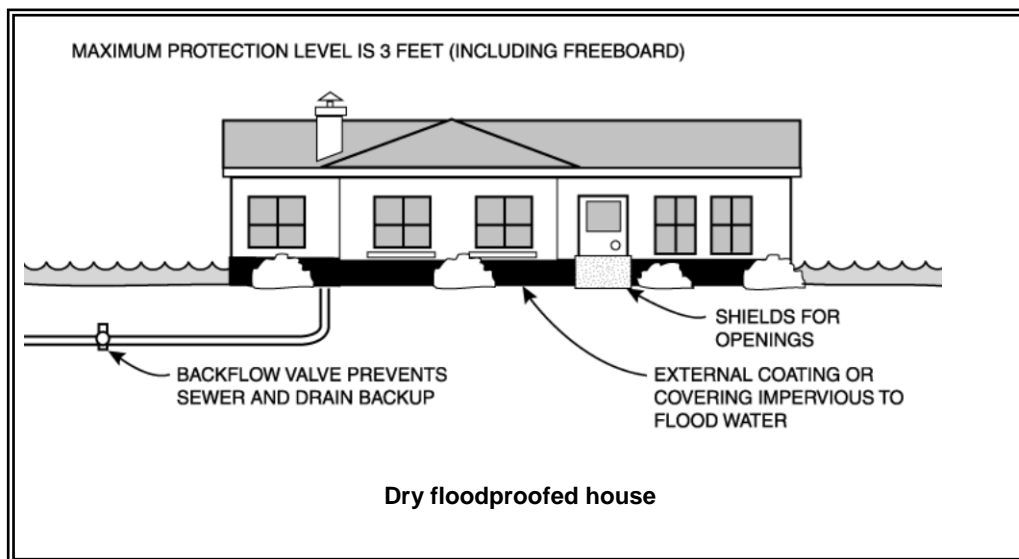
## 5.2 Retrofitting – Modify the Building

Section 5.1 focused on keeping the hazard from reaching a building or damage-prone part of a property. An alternative is to modify or “retrofit” the site or building to minimize or even prevent damage. There are a variety of techniques to do this. This section looks at the measures that can be implemented to protect existing buildings from damage by floods, sewer backup, earthquakes, tornadoes, summer and winter storms.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

### 5.2.1 Flood Retrofitting - Buildings

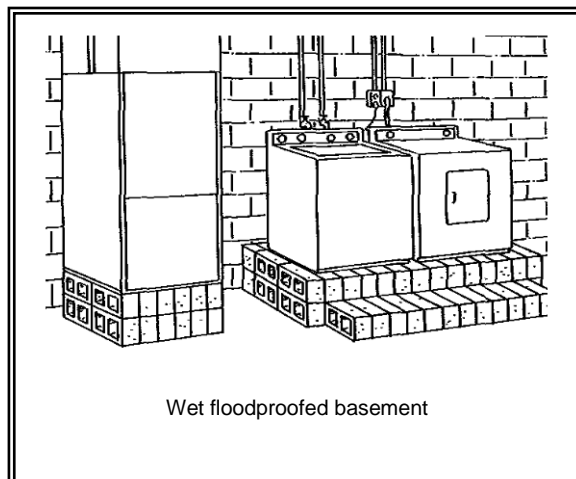
Flood retrofitting measures include dry floodproofing where all areas below the flood protection level are made watertight. Walls are coated with waterproofing compounds or plastic sheeting. Openings (doors, windows, and vents) are closed, either permanently, with removable shields, or with sandbags.



Dry floodproofing of new and existing nonresidential buildings in the regulatory floodplain is permitted under State, FEMA and County regulations. Dry floodproofing of existing residential buildings in the floodplain is also permitted as long as the building is not substantially damaged or being substantially improved. Owners of buildings located outside the regulatory floodplain can always use dry floodproofing techniques.

The alternative to dry floodproofing is wet floodproofing. Wet floodproofing means that water is let in and everything that could be damaged by a flood is removed or elevated above the flood level. Structural components below the flood level are replaced with materials that are not subject to water damage. For example, concrete block walls are used instead of wooden studs and gypsum wallboard. The furnace, water heater, and laundry facilities are permanently relocated to a higher floor. Where the flooding is not deep, these appliances can be raised on blocks or platforms.

Wet floodproofing has one advantage over the other approaches: no matter how little is done, flood damage is reduced. Thousands of dollars in damage can be prevented by simply moving furniture and electrical appliances out of a basement.



A third flood protection modification addresses flooding caused by overloaded sanitary or combined sewers. Four approaches may be used to protect a structure against sewer backup: floor drain plugs, floor drain stand-pipes, overhead sewers, and backflow protection valves.

The first two devices keep water from flowing out of the lowest opening in the building, the floor drain. They cost less than \$25. However, if water becomes deep enough in the sewer system, it can flow out of the next lowest opening, such as a toilet or tub, or it can overwhelm a drain plug by hydrostatic pressure and flow into the building through the floor drain. The other two measures, overhead sewers and backflow protection valves keep water in the sewer line during a backup. These are more secure, but more expensive (\$3,000-\$4,000).

For dry floodproofing, wet floodproofing, and sewer backup prevention, it is important to consider what contents of a building are suitable for keeping in basements or crawl spaces. Valuable and invaluable items, such as, photographs, should be kept elsewhere in the event that the seepage or flooding occurs even with the retrofitting measures in place.

**Local Implementation:** A number of overhead sewers and backup valves have been installed in the Village of Dwight, and check valves in Fairbury.

### 5.2.2 Tornado Retrofitting

Tornado retrofitting measures include constructing an underground shelter or "safe room" at the first floor level to protect the lives of the occupants. Their worth has been proven by tornadoes in Oklahoma, as shown in the photo to the left. They can be installed for approximately \$3,000.



Safe rooms are built by connecting all parts of the shelter together (walls, roof and foundation) using adequate fasteners or tie downs. These help hold the safe room together when the combination of high wind and pressure differences work to pull the walls and ceiling apart. The walls of the safe room are constructed out of plywood and metal sheeting to

protect people from windborne missiles (flying debris) with the strong winds of a tornado. More information on safe rooms can be found in FEMA Publication 320.

Another retrofitting approach for tornadoes and high winds is to secure the roof, walls and foundation with adequate fasteners or tie downs. These help hold the building together when the combination of high wind and pressure differences work to pull the building apart. This measure also applies to manufactured homes.

A third tornado and high wind protection modification is to strengthen garage doors, windows and other large openings. If winds break the building's "envelope," the pressures on the structure are greatly increased. Impact-resistant glass is also recommended for high wind or tornado protection.

### 5.2.3 Summer Storm Retrofitting

Retrofitting approaches to protect private or public buildings from the effects of thunderstorms include:

- storm shutters
- lightning rods (illustrated on the previous page)
- strengthening connections and tie-downs (similar to tornado retrofitting)
- impact-resistant glass in window panes
- surge protectors at electrical outlets

Also, roofs can be replaced with materials less susceptible to damage by **hail**, such as modified asphalt or formed steel shingles.



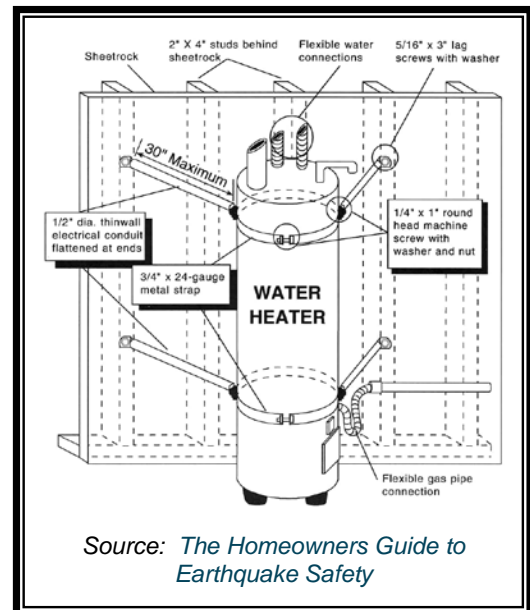
### 5.2.4 Winter Storm Retrofitting

Winter storm retrofitting measures include improving insulation on older buildings and relocating water lines from outside walls to interior spaces. Windows can be sealed or covered with an extra layer of glass (storm windows) or plastic sheeting. Roofs can be retrofitted to shed heavy loads of snow and prevent ice dams that form when snow melts.

### 5.2.5 Earthquake Retrofitting - Buildings

Earthquakes, or seismic events, present two hazards for buildings and people – a hazard for the structure itself and a hazard for the building's contents (non-structural hazard). Earthquake retrofitting measures for the structure include:

- removing masonry overhangs that will fall onto the street during shaking
- bracing the walls of the building provides structural stability
- bolting sill plates to the foundation



These measures can be very expensive and should be considered for buildings on a case by case basis.

Measures that protect against non-structural seismic hazards typically involve small modifications. Retrofitting activities for non-structural hazards include:

- tying down appliances, water heaters, bookcases, and fragile furniture so they won't fall over during a quake
- installing latches on drawers and cabinet doors
- mounting picture frames and mirrors securely
- installing flexible utility connections for water and gas lines
- anchoring and bracing propane tanks and gas cylinders

These approaches can be very cost effective and have little or no impact on the appearance of a building, yet they are important measures for keeping buildings safer and protecting lives during earthquake events.

While these simple and inexpensive measures may be cost effective for a home or business, they may not be sufficient for protection of critical facilities. Fire stations need to be sure that they can open their doors and hospitals must be strong enough to continue operating during the shocks and aftershocks. Again, critical facilities should be evaluated on a case by case basis.

#### 5.2.6 Earthquake Retrofitting – Infrastructure and Lifelines

Infrastructure hardening, attention to lifelines and bridge strengthening are important elements of earthquake mitigation. From FEMA Publication Number 271, *Seismic Design Guidelines and Standards for Lifelines* (1996):

Lifelines are the public works and utility systems that support most human activities: individual, family, economic, political, and cultural. The various lifelines can be classified under the following five systems: electric power, gas and liquid fuels, telecommunications, transportation, and water supply and sewers.

The first step in protecting lifeline systems is the prioritization of critical facilities, utility systems, and other infrastructure. The involvement of state agencies, such as the Illinois Department of Transportation, is important. The involvement of private owners of utility systems is also important. FEMA, through the National Earthquake Hazard Reduction Program (NEHRP) and the Central United States Earthquake Consortium offer technical guidance on retrofitting approaches.

### 5.3 Insurance

Insurance does not mitigate damage caused by a natural hazard, However, it does help the owner repair, rebuild and (hopefully) afford to incorporate some appropriate mitigation measures in the process.

Insurance has the advantage that, as long as the policy is in force, the property is protected and no human intervention is needed for the measure to work. A standard homeowner's insurance policy will cover a property for the hazards of tornado, wind, hail, and winter storms. Separate endorsements are usually needed for earth movement (e.g., earthquake) coverage.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
Y	Flood
Y	Extreme Heat
Y	Extreme Cold
	Transportation Incident
	Radiological Incident
Y	Utility Interruption
	Other Manmade Incident

Although most homeowner's insurance policies do not cover a property for flood damage, an owner can insure a building for damage by surface flooding through the National Flood Insurance Program. Flood insurance coverage is provided for buildings and their contents damaged by a "general condition of surface flooding" in the area.

Some people have purchased flood insurance because it was required by the bank when they got a mortgage or home improvement loan. Usually these policies just cover the building's structure and not the contents. Renters can buy contents coverage, even if the owner does not buy structural coverage on the building. There is limited coverage for basements and the below grade floors of bi-levels and tri-levels.

Several insurance companies have sump pump failure or sewer backup coverage that can be added to a homeowner's insurance policy. Each company has different amounts of coverage, exclusions, deductibles, and arrangements. Most are riders that cost extra. Most exclude damage from surface flooding that would be covered by a National Flood Insurance policy.

Larger local governments can self-insure and absorb the cost of damage to one facility, but if many properties are exposed to damage, self-insurance can be a major drain on the treasury. Communities cannot expect Federal disaster assistance to make up the difference. Under Section 406(d) of the Stafford Act.

If an eligible insurable facility damaged by flooding is located in a [mapped floodplain] ... and the facility is not covered (or is underinsured) by flood insurance on the date of such flooding, FEMA is required to reduce Federal disaster assistance by the *maximum* amount of insurance proceeds that would have been received had the buildings and contents been fully covered under a National Flood Insurance Program (NFIP) standard flood insurance policy. [Generally, the maximum amount of proceeds for a non-residential property is \$500,000.]

- [Communities] need to:
- Identify all insurable facilities, and the type and amount of coverage (including deductibles and policy limits) for each. The anticipated insurance proceeds will be deducted from the total eligible damages to the facilities.
- Identify all facilities that have previously received Federal disaster assistance for which insurance was required. Determine if insurance has been maintained. *A failure to maintain the required insurance for the hazard that caused the disaster will render the facility ineligible for Public Assistance funding....*
- [Communities] *must* obtain and maintain insurance to cover [their] facility - buildings, equipment, contents, and vehicles - for the hazard that caused the damage in order to receive Public Assistance funding. Such coverage must, at a minimum, be in the amount of the eligible project costs. FEMA will not provide assistance for that facility in future disasters if the requirement to purchase insurance is not met. – FEMA Response and Recovery Directorate Policy No. 9580.3, August 23, 2000

In other words, the law expects public agencies to be fully insured as a condition of receiving Federal disaster assistance.

**Earthquake Insurance:** Earthquakes are not covered under standard homeowners or business insurance policies, but coverage is usually available for earthquake damage in the form of an endorsement to a home or business insurance policy. Cars and other vehicles are covered for earthquake damage under the comprehensive part of the auto insurance policy. In Livingston County, property owners can obtain earthquake insurance.

- Earthquake insurance provides coverage for your dwelling, for your personal property, and for any additional living expense (ALE). ALE coverage can include costs for the following:

- Temporary rental home, apartment, or hotel room
- Restaurant meals
- Telephone or utility installation in a temporary residence
- Relocation and storage
- Furniture Rental
- Laundry

Premiums for earthquake insurance are very low, but deductibles are often very high.

**Local Implementation:** Flood insurance has been available in Livingston County communities since the 1970's. Current flood insurance coverage is over 460 policies. The majority of the flood insurance policies are in the City of Pontiac. A notable number of policies are also in force in Dwight and unincorporated parts of the County.

Most communities in Livingston County are enrolled in either the Illinois Municipal League Risk Management Association (IMLRMA). IMLRMA provides risk management advice and coverage for all of the hazards covered in this Plan, including flood and earthquake. Livingston County participates in a similar insurance program.

## 5.4 The Government's Role

Property protection measures are usually considered the responsibility of the property owner. However, local governments should be involved in all strategies that can reduce flood losses, especially acquisition and conversion of a site to public open space. There are various roles the County or a municipality can play in encouraging and supporting implementation of these measures.

**Government Facilities:** One of the first duties of a local government is to protect its own facilities. Fire stations, water treatment plants and other critical facilities should be a high priority for retrofitting projects and insurance coverage.

Often public agencies discover after the disaster that their "all-hazard" insurance policies do not cover the property for the type of damage incurred. Flood insurance is even more important as a mitigation measure because of the Stafford Act provisions discussed above.

**Public Information:** Providing basic information to property owners is the first step in supporting property protection measures. Owners need general information on what can be done. They need to see examples, preferably from nearby. Public information activities that can promote and support property protection are covered in Chapter 9.

**Financial Assistance:** Communities can help owners by helping to pay for a retrofitting project. Financial assistance can range from full funding of a project to helping residents find money from other programs. Some communities assume responsibility for sewer backups, street flooding, and other problems that arise from an inadequate public sewer or public drainage system.

Less expensive community programs include low interest loans, forgivable low interest loans and rebates. A forgivable loan is one that does not need to be repaid if the owner does not sell the house for a specified period, such as five years. These approaches don't fully fund the project but they cost the community treasury less and they increase the owner's commitment to the flood protection project. Often, small amounts of money act as a catalyst to pique the owner's interest to get a self-protection project moving.

The City of Guthrie, Oklahoma, has a rebate program for installation of tornado shelters and safe rooms. The City provides up to \$1,500 per house, which can cover the majority of the cost.

The more common outside funding sources are listed below. Funding under item 3 is only available after a disaster, not before, when damage could be prevented. Following past disaster declarations, FEMA, the Illinois Emergency Management Agency (IEMA) and the Illinois Department of Natural Resources have provided advice on how to qualify and apply for these funds.

1. Pre-disaster funding sources

- FEMA's Pre-Disaster Mitigation (PDM) grants (administered by IEMA)
- FEMA's Flood Mitigation Assistance (FMA) grants (administered by IEMA)
- Community Development Block Grant (administered by the Department of Commerce and Economic Opportunity)
- Illinois Department of Natural Resources
- Conservation organizations, such as the Conservation Foundation and CorLands, although generally these organizations prefer to purchase vacant land in natural areas, not properties with buildings on them.

2. Post-disaster funding sources

- Insurance claims
- The National Flood Insurance Program's Increased Cost of Compliance provision (which increases the claim payment to cover a flood protection project required by code as a condition to rebuild the flooded building)

3. Post-disaster funding sources, Federal disaster declaration needed

- FEMA's disaster assistance (for public properties, however, after a flood, the amount of assistance will be reduced by the amount of flood insurance that the public agency should be carrying on the property) (administered by IEMA)
- Small Business Administration disaster loans (for non-governmental properties)
- FEMA's Hazard Mitigation Grant Program (administered by IEMA)

**Acquisition Agent:** The community can be the focal point in an acquisition project. Most funding programs require a local public agency to sponsor the project. The County or a municipality could process the funding application, work with the owners, and provide some, or all, of the local share.

**Mandates:** Mandates are considered a last resort if information and incentives aren't enough to convince a property owner to take protective actions. An example of a retrofitting mandate is the requirement that many communities have that downspouts be disconnected from the sanitary sewer line.

There is a mandate for improvements or repairs made to a building in the mapped floodplain. If the project equals or exceeds 50 percent of the value of the original building it is considered a "substantial improvement." The building must then be elevated or otherwise brought up to current flood protection codes.



Another possible mandate is to require less expensive hazard protection steps as a condition of a building permit. For example, many communities require upgraded electrical service as a condition of a home improvement project. If a person were to apply for a permit for electrical work, the community could require that the service box be moved above the base flood elevation or the installation of separate ground fault interrupter circuits in the basement.

## 5.5 Repetitive Flood Loss Properties

Chapter 2 explains the criteria for designation of the County's repetitive loss properties –two federal flood insurance claims of at least \$1,000 in any ten year period. These properties deserve special attention because they are more prone to damage by natural hazards than any other properties in the County. Further, protecting repetitive loss buildings is a priority with FEMA and IEMA mitigation funding programs.

When repetitive loss properties are reviewed, the key factors listed below should be used to determine appropriate property protection measures. The criteria used are based on several studies that have identified appropriate measures based on flood and building conditions. While a cost/benefit study was not conducted on each property, these guidelines show which measures are cost-effective.

### **National Flood Insurance Reform Act of 2003 Definition of Repetitive Flood Loss**

“ . . . a building covered by a contract for flood insurance that has incurred flood-related damages on two occasions during a 10-year period ending on the date of the event for which a second claim is made, in which the cost of repairing the flood damage, on the average, equaled or exceeded 25 percent of the market value of the building at the time of each such flood event.

- “High hazard areas” are areas in the floodway or where the 100-year flood is two or more feet over the first floor.
- Buildings in high hazard areas or in less than good condition should be acquired and demolished.
- Buildings with basements and split-level foundations in high hazard areas should be acquired and demolished. They are too difficult to elevate and the hydrostatic pressures on the walls from deeper flooding make them too risky to protect in place.
- Buildings subject to shallow flooding from local drainage should be protected through area-wide flood control or sewer improvement projects.
- Buildings in good condition on crawlspaces should be elevated or relocated.
- Buildings in good condition on slab, basement or split-level foundations subject to shallow flooding (less than 2 feet) can be protected by barriers and dry floodproofing.
- Recent flood claims. Some properties have not had a flood insurance claim for 20 years, indicating that some measure has probably been put in place to protect the property from repetitive flooding.

These criteria are general, and recommendations for individual structures should be made only after a site inspection. Other extenuating circumstances may also alter the recommendations.

**Local Implementation:** FEMA flood insurance data shows eight repetitive loss structures located in Pontiac within the Vermilion River floodplain and nearby Chautauqua Park. Note that addresses of repetitive flood loss are not provided in this Plan. That information is confidential. The eight repetitive loss structures are single family homes. Only two of the eight homes are currently covered by flood insurance. It is recommended in this Plan that these homes, and neighboring homes, be further investigated to determine the most cost-beneficial flood mitigation approach to protect them from future flood damage. A determination should be made of the extent of the repetitive loss area based on first floor elevations. The repetitive loss area may include dozens of homes.

## 5.6 Conclusions

1. Property protection measures are important for Livingston County. In particular:
  - a. Protection of structures, people, and animals from wind and severe storm hazards.
  - b. Flood protection from rivers and streams and from sewer back-ups.
  - c. Protection of structures, people, animals, and infrastructure from manmade hazards.
  - d. Protection of critical facilities.
2. There are several ways to protect individual properties from damage by natural hazards. The advantages and disadvantages of each should be examined for each situation.
3. Property owners can implement some property protection measures at little cost, especially for sites in areas of low hazards (e.g., shallow flooding, sewer backup, summer, and winter storms). For other measures, such as relocation, elevation and safe rooms, the owners may need government agency assistance.

## 5.7 Recommendations

1. Public education materials should be developed to explain property protection measures that can help owners reduce their exposure to damage by hazards and the various types of insurance coverage that are available.
2. All repetitive flood loss areas (repetitive loss homes and neighboring homes) should be further investigated and mitigated.
3. All buildings and critical facilities in the floodplain, with priority given to buildings or facilities in the floodway, should be mitigated, to the extent that the measures are cost effective and feasible.
4. The availability of tornado shelters or safe rooms in Livingston County should be investigated
5. Safe rooms should be constructed wherever needed in Livingston County with priority given to schools and critical facilities.
6. Most property protection projects should be voluntary, but in some circumstances, projects should be required (per ordinances).
7. A standard checklist should be developed to evaluate a property's exposure to damage from the hazards most prevalent in Livingston County. The checklist should be provided to each agency participating in this planning process and made available to the general public.
8. Each public entity should evaluate its own properties using the standard checklist. A priority should be placed on determining critical facilities' vulnerability to damage.
9. All property owners (private and public) should determine if they are adequately insured for natural hazards, including floodplain property owners carrying National Flood Insurance.
10. The County and municipalities should consider the feasibility of providing information and technical advice to floodplain property owners for protecting their property.

11. Livingston County should seek property protection financial assistance for flood and tornado mitigation projects for properties at risk.

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## Chapter 6. Structural Projects

Structural projects are projects that are constructed to protect people and infrastructure from damage due to natural hazards. Often, they are referred to as regional projects or alternative, because they typically protect a number of buildings or properties. Structural projects are usually funded by public agencies. Preventing damage due to flooding is the primary focus of structural projects, but structural projects can also address manmade hazards, such as, hazardous material containment or the protection of infrastructure.

Structural projects have traditionally been used by communities to control or manage floodwaters. Structural projects keep flood waters away from an area by constructing barriers, by storing floodwater elsewhere, or by redirecting flood flows. Larger structural flood control projects have regional or watershed-wide implications and can be very expensive. Because of this, they are often planned, funded and implemented at a regional level by agencies, such as the Illinois Department of Natural Resources, Office of Water Resources, the U.S. Army Corps of Engineers, and the USDA Natural Resources Conservation Service.



Vermilion River, Pontiac, Illinois

Six approaches are reviewed in this Chapter:

- Reservoirs and detention
- Channel improvements
- Levees and barriers
- Crossings and roadways
- Drainage and storm sewer improvements
- Drainage system maintenance

Structural projects offer advantages not provided by other measures, though they also have shortcomings. The appropriateness of using structural flood control depends on individual project area circumstances.

Since structural flood control is generally the most expensive type of mitigation measure in terms of installation costs, maintenance requirements and environmental impacts, a thorough alternative assessment should be conducted before choosing a structural project. In some circumstances smaller flood control measures may be included in a package of several recommended measures for a project area where non-structural measures would not be practical or effective.

## 6.1 Reservoirs and Detention

Reservoirs reduce flooding by temporarily storing flood waters behind dams or in storage or detention basins. Reservoirs lower the flood height by holding back, or detaining, runoff before it can flow downstream. Flood waters are detained until the flooding has subsided, then the water in the reservoir or detention basin is released or pumped out slowly at a rate that the river can accommodate downstream.

Reservoirs can be dry and remain idle until a large rain event occurs. Or they may be designed so that a lake or pond is created. The lake may provide recreational benefits or water supply (which could help mitigate a drought).

Reservoirs are most commonly built for one of two purposes. Large reservoirs are constructed to protect property from existing flood problems. Smaller reservoirs or detention basins are built to protect property from the impacts of new development (i.e., more runoff). Reservoirs are also constructed to contain retain pollutants.

Regardless of size, reservoirs protect the development that is downstream from the reservoir site. Unlike levees and channel modifications, they do not have to be built close to or disrupt the area to be protected. Reservoirs are most efficient in deeper valleys where there is more room to store water, or on smaller rivers where there is less water to store.

There are several considerations when evaluating use of reservoirs and detention:

- There is the threat of flooding the protected area should the reservoir's dam fail.
- There is a constant expense for management and maintenance of the facility.
- They may fail to prevent floods that exceed their design levels.
- Sediment deposition may occur and reduce the storage capacity over time.
- They can impact water quality as they are known to affect temperature, dissolved oxygen and nitrogen, and nutrients.
- If not designed correctly, they may cause backwater flooding problems upstream.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

## 6.2 Channel Improvements

By improving channel's conveyance, more water is carried away at a faster rate. Three types of channel improvements are reviewed here: dredging the channel bottom; projects that make the channel wider, straighter or smoother; and diversion of high flows to another channel or body of water.

**Dredging** for the purpose of floodwater management is often viewed as a form of conveyance improvement. However, it has the following problems:

- Given the large volume of water that comes downstream during a flood, removing a foot or two from the bottom of the channel will have little effect on flood heights.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

- Dredging is often cost prohibitive because the dredged material must be disposed of somewhere.
- Unless instream and/or tributary erosion are corrected upstream, the dredged areas usually fill back in within a few years, and the process and expense have to be repeated.
- If the channel has not been disturbed for many years, dredging will destroy the habitat that has developed.
- To protect the natural values of the stream, Federal law requires a Corps of Engineers permit before dredging can proceed. This can be a lengthy process that requires much advance planning and many safeguards to protect habitat.

Straightening, deepening and/or widening a stream or river channel, commonly referred to as “**channelization**” has traditionally been the common remedy for local drainage or flooding problems. Here are the concerns with this approach that need to be kept in mind:

- Channelized streams can create or worsen flooding problems downstream as larger volumes of water are transported at a faster rate.
- Channelized streams rise and fall faster. During dry periods the water level in the channel is lower than it should be, which creates water quality problems and degrades habitat.
- Channelized waterways tend to be unstable and experience more streambank erosion. The need for periodic reconstruction and silt removal becomes cyclic, making channel maintenance very expensive.

On the other hand, properly sloped and planted channel banks are more aesthetically and environmentally appealing, and can prove cheaper to maintain than concrete ditches.

A **diversion** is a new channel that sends floodwaters to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During flood flows, the floodwaters spill over to the diversion channel or tunnel, which carries the excess water to a receiving lake or river. Diversions are limited by topography; they will not work in some areas. Unless the receiving water body is relatively close to the floodprone stream and the land in between is low and vacant, the cost of creating a diversion can be prohibitive.

## 6.3 Levees and Barriers

### Levees and Floodwalls for Flood Control

Probably the best known flood control measure is a barrier of earth (levee) or concrete (floodwall) erected between the watercourse and the property to be protected. Levees and floodwalls confine water to the stream channel by raising its banks. They must be well designed to account for large floods, underground seepage, pumping of internal drainage, and erosion and scour.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
Y	Other Manmade Incident

Key considerations when evaluating use of a levee include:

- Removal of fill to compensate for the floodwater storage that will be displaced by the levee
- Internal drainage of surface flows from the area inside the levee.
- Cost of construction
- Cost of maintenance

- River access and views
- Creating a false sense of security (while levees may reduce flood damage for smaller more frequent rain events, they may also overtop or breach in extreme flood events and subsequently create more flood damage than would have occurred without the levee)

Levees placed along the river or stream edge degrade the aquatic habitat and water quality of the stream. They also are more likely to push floodwater onto other properties upstream or downstream. To reduce environmental impacts and provide multiple use benefits a setback levee (set back from the floodway) is the best project design. The area inside a setback levee can provide open space for recreational purposes and provide access sites to the river or stream.

Floodwalls perform like levees except they are vertical-sided structures that require less surface area for construction. Floodwalls are constructed of reinforced concrete, which makes the expense of installation cost prohibitive in many circumstances. Floodwalls also degrade adjacent habitat and can displace erosive energy to unprotected areas of shoreline downstream.

### Berms and Barriers for Potential Manmade Hazards

Earthen berms, concrete walls, and other barriers have been effectively used for the containment of hazardous materials, and for the protection of critical facilities.

Bridge piers can be protected with bulkheads being placed in front of the piers.

## 6.4 Crossings and Roadways

In some cases buildings may be elevated above floodwaters but access to the building is lost when floodwaters overtop local roadways, driveways, and culverts or ditches. Depending on the recurrence interval between floods, the availability of alternative access, and the level of need for access, it may be economically justifiable to elevate some roadways and improve crossing points.

For example, if there is sufficient downstream channel capacity, a small culvert that constricts flows and causes localized backwater flooding may be replaced with a larger culvert to eliminate flooding at the waterway crossing point. The potential for worsening adjacent or downstream flooding needs to be considered before implementing any crossing or roadway drainage improvements.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident

**Local implementation:** The FEMA Flood Insurance Study for Livingston County shows seven roadways or bridges would be overtopped during the 100-year flood event. This information is summarized in the table below. The table also includes bridges or culverts that participating communities identified as areas of concern and structures that should be evaluated for improvements:

**Table 6-1**  
**Livingston County Bridges Overtopped in 100-year Flood Event**  
**or Locations of Sediment Accumulation**

Community	Bridge or Roadway	Stream	Notes
Dwight	Brewster Road	Gooseberry Creek	FEMA Flood Profile*
Dwight	McNamara Ave./ Rte. 46	Gooseberry Creek	FEMA Flood Profile
Dwight	East Mazon Ave/Rte. 17	Gooseberry Creek	FEMA Flood Profile
Dwight	East Delaware Street	Gooseberry Creek	FEMA Flood Profile
Dwight	East South Street	Gooseberry Creek	FEMA Flood Profile
Dwight	South Franklin Street	Gooseberry Creek	FEMA Flood Profile
Odell	Road to Treatment Plant	--	
Pontiac	Vermilion Street	Vermilion River	FEMA Flood Profile
Reading Township	Coalville Road	--	Sinking due to mine subsidence
Reading Township	Abandoned Bridge DS of Dam	Vermilion River	Sediment accumulation
Saunemin	South of IL 47 and IL 116	5 Mile Creek	Sediment accumulation

\* Livingston County Flood Insurance Study, December 2007

## 6.5 Drainage System Maintenance

The drainage system may include detention ponds, stream channels, swales, ditches and culverts. Drainage system maintenance is an ongoing program to clean out blockages caused by an accumulation of sediment or overgrowth of weedy, non-native vegetation or debris, and remediation of streambank erosion sites.

"Debris" refers to a wide range of blockage materials that may include tree limbs and branches that accumulate naturally, or large items of trash or lawn waste accidentally or intentionally dumped into channels, drainage swales or detention basins. Maintenance of detention ponds may also require revegetation or repairs of the restrictor pipe, berm or overflow structure.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
	Tornado
Y	Flood
	Extreme Heat
	Extreme Cold
	Transportation Incident
	Radiological Incident
	Utility Interruption
	Other Manmade Incident



**A regular inspection and maintenance program can remove debris before it becomes an obstruction to stream flows.**

Maintenance activities normally do not alter the shape of the channel or pond, but they do affect how well the drainage system can do its job. Sometimes it is a very fine line that separates debris that should be removed from natural material that helps form habitat. Therefore, written procedures that are consistent with state laws and environmental concerns are usually needed.

Government agencies usually accept responsibility for maintaining facilities on public property. However, in Illinois, the responsibility for drainageway maintenance on private property, when no easements have been granted, is with the individual private property owner.



This often results in very little maintenance being accomplished.

**Local implementation:** Livingston County drainage systems perform relatively well. However, sedimentation and other obstructions exist in Emington, Pontiac and Reading Township.

## 6.6 Conclusions

1. Potential structural flood protection projects may be appropriate for some areas of Livingston County, such as Reading Township, Pontiac and Dwight. However, it should be understood that structural projects can have adverse impacts on downstream properties and on the environment. They can also be very expensive.
2. Structural projects can be effective in protecting critical facilities from natural hazards.
3. There are a number of locations where bridge or culvert replacement or enlarging should be considered. However, as with structural projects, such work can potentially increase flood problems elsewhere.
4. Stream maintenance is needed in a number of areas throughout the County.

## 6.7 Recommendations

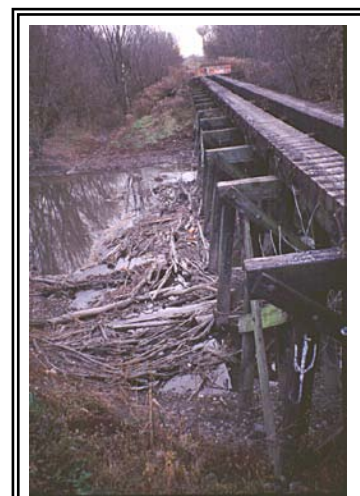
1. Structural flood control projects, including drainage and bridge and culvert improvements, should be pursued, provided they meet the following criteria:

- Each project's study looks beyond the immediate project site to ensure that no other properties upstream or downstream will be adversely impacted.
- Each project should be based on a watershed master plan or, at a minimum, coordinated with other projects in the same watershed.
- Each project's study considers protecting the natural functions of the stream and floodplain, in addition to flood protection.
- Each project's study considers alternative non-structural approaches to protect the affected properties from flood damage.
- The design and construction is certified by a licensed professional engineer.
- Opportunities for stream and natural areas restoration are incorporated wherever feasible.
- Communities and property owners that may be affected by the project are notified early in the project process.
- All relevant federal, state and local permits are obtained, including Corps of Engineer's 404 permits and IDNR floodway permits.

2. Each municipality and the County should implement a formal and regular drainage system maintenance program.

3. Removal of sedimentation and waterway obstructions should be fully investigated.

4. Structural projects should be investigated for the containment of spills, including those from farmland, to protect the people and resources of Livingston County.



Periodic inspections and debris removal are needed to prevent dams in streams

5. Opportunities should be sought to help fund mitigation measures for existing infrastructure or infrastructure improvements throughout the County from FEMA and other sources.

## **6.8 References**

1. Studies listed on page 6-2 of this chapter.
2. *Flood Insurance Study, Livingston County, Illinois*, FEMA, 2007.
3. Survey of municipalities and County offices, 2010.

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## Chapter 7. Emergency Services

Emergency services measures protect people before, during, and after a disaster. Emergency services measures protect life and property in four phases: mitigation, preparedness, response and recovery. A good emergency management program addresses all hazards, and it involves all municipal and/or county departments.

At the state level, programs are coordinated by the Illinois Emergency Management Agency (IEMA). Livingston County emergency services are coordinated through the Livingston County Office of Emergency Services and Disaster Assistance (ESDA) in Pontiac. Livingston County municipalities that have emergency management programs coordinate them through their fire or police department or a separate emergency manager or Emergency Services and Disaster Agency coordinator. There currently is no full-time emergency manager at the county or municipal level in Livingston County. Currently, emergency management responsibilities are shared with other job responsibilities.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
Y	Flood
Y	Extreme Heat
Y	Extreme Cold
Y	Transportation Incident
Y	Radiological Incident
Y	Utility Interruption
Y	Other Manmade Incident

This chapter reviews emergency services measures following a chronological order of responding to an emergency. It starts with identifying an oncoming problem (threat recognition) and goes through post-disaster activities.

### Stream Gauges

#### USGS Site:

<http://waterdata.usgs.gov/nwis/uv?05554500>

#### FEMA:

<http://www.msc.fema.gov>

#### National Weather Service:

<http://www.crh.noaa.gov/lot/>

## 7.1 Threat Recognition

Threat recognition is the key to health and safety and property protection. This is easier with natural hazards than with manmade hazards. The first step in responding to a flood, tornado, storm, or other natural hazard is knowing when weather conditions are such that an event could occur. Man-made hazards, as they exist in our county, need to be pre-determined so that timely threat recognition may occur. With a proper and timely threat recognition system, adequate warnings can be disseminated.

**Floods:** A flood threat recognition system predicts the time and height of the flood crest. This can be done by measuring rainfall, soil moisture, and stream flows upstream of the community and calculating the subsequent flood levels.

On larger rivers, including the Vermilion River, the measuring and calculating is done by the National Weather Service, which is in the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA). Support in NOAA's efforts is provided by cooperating partners from state and local agencies.



Forecasts of expected river stages are made through the Advanced Hydrologic Prediction Service (AHPS) of the National Weather Service. Flood threat predictions are disseminated on the NOAA Weather Wire or NOAA Weather Radio. NOAA Weather Radio is considered by the federal government to be the official source for weather information.

On smaller rivers, locally established rainfall and river gauges are needed to establish a flood threat recognition system. The National Weather Service may issue a "flash flood watch." This means the amount of rain expected will cause ponding and other flooding on small streams and depressions. These events are so localized and so rapid that a "flash flood warning" may not be issued, especially if no remote threat recognition equipment is available.

In the absence of a gaging system on small streams, the best threat recognition system is to have local personnel monitor rainfall and stream conditions. While specific flood crests and times will not be predicted, this approach will provide advance notice of potential local or flash flooding.

Real-time stream gage readings for sites on the Vermilion River can be accessed on the internet at the USGS website for current stream conditions. The USGS monitors the gage site on the Vermilion River at Pontiac. The National Weather Service is able to issue a specific *prediction* of when and how high the Vermilion River will crest. The prediction can be accessed at <http://www.crh.noaa.gov/lot/>. National Weather Service can also issue more general flood statements on smaller streams throughout the County.

Flood maps can be viewed on line or purchased through FEMA. The website is <http://www.msc.fema.gov>

**Tornadoes and Thunderstorms:** The National Weather Service is the prime agency for detecting meteorological threats, such as tornadoes and thunderstorms. Severe weather warnings are transmitted through the Illinois State Police's Law Enforcement Agencies Data System (LEADS) and through the NOAA Weather Radio System. As with floods, the Federal agency can only look at the large scale, e.g., whether conditions are appropriate for formation of a tornado. For tornadoes and thunderstorms, local emergency managers can provide more site-specific and timely recognition by sending out National Weather Service trained spotters to watch the skies when the National Weather Service issues a watch or warning.

**Winter Storms:** The National Weather Service is also the prime agency for predicting winter storms. Severe snow storms can often be forecasted days in advance of the expected event, which allows time for warning and preparation. Though more difficult, the National Weather Service can also forecast ice storms.



**Extreme Cold/Extreme Heat:** The National Weather Service is also the prime agency for predicting extreme cold and extreme heat events. These events can often be forecasted days in advance of the expected event, which allows time for warning and preparation.

**Other Weather Hazards:** Livingston County dispatch centers receive other severe weather alerts from the LEADS system. These alerts are issued by the Illinois State Police who monitor the NOAA Weather Wire, or through their monitoring of NOAA weather radios. Police and fire stations, schools, county and municipal buildings, and some private facilities have been issued Weather Radios, or they are notified over the EAS.

Hazardous weather and damage is reported to 911 Dispatch.

**Transportation Incidents:** Livingston County dispatch centers would receive notification of these interruptions through 911 calls from citizens.

**Radiological Incidents:** Exelon Corporation is responsible for threat recognition at the LaSalle County Nuclear Generating Station. They have developed plans to protect the public in the event of a nuclear event. First, control room operators at the power plant would immediately notify local authorities. At the same time, special teams would begin testing radiation levels outside the plant and throughout the surrounding areas. If necessary, area officials would declare an emergency and take the following measures to ensure public safety: Activate community warning sirens, broadcast emergency information and instruction to the public over local radio and TV stations, including information regarding evacuation or shelter-in-place. Evacuation routes have been developed and coordinated with reception communities of Dixon, Rockford, and Freeport. Livingston is not a reception community because prevailing winds could make evacuation toward our area dangerous.

Transportation related radiological incidents would be identified the same as all other transportation incidents, but the response would involve numerous agencies.

**Utility Interruption:** Livingston County dispatch centers would receive notification of these interruptions through 911 calls from citizens.

**Hazardous Materials:** Livingston County dispatch centers would receive the first notification of a hazardous materials incident. The local fire departments also respond to the incident. Livingston County has a statewide hazardous materials response team at their disposal for additional assistance with hazardous materials incidents.

## 7.2 Warning

After the threat recognition system tells the ESDA and municipalities that a flood, tornado, thunderstorm, winter storm, or other hazard is coming, the next step is to notify the public and staff of other agencies and critical facilities. The earlier and the more specific the warning, the greater the number of people who can implement protection measures for the safety and lives of people and animals.

The National Weather Service issues notices to the public using two levels of notification:

*Watch:* conditions are right for flooding, thunderstorms, tornadoes or winter storms.

*Warning:* a flood, tornado, etc. has started or has been observed.

*Red Flag Warning:* critical fire weather conditions are either occurring now, or will shortly. The low relative humidity and high dispersion indices will enhance fire growth potential.



A more specific warning may be disseminated by the community in a variety of ways. The following are the more common methods:

- Outdoor warning sirens
- Sirens on public safety vehicles
- Commercial or public radio or TV stations
- The Weather Channel

- Cable TV emergency news inserts
- Telephone trees/mass telephone notification
- NOAA Weather Radio
- Tone activated receivers in key facilities
- Door-to-door contact
- Mobile public address systems
- E-mail notifications

Multiple or redundant systems are most effective – if people do not hear one warning, they may still get the message from another part of the system. Each has advantages and disadvantages:

- Radio and television provide a lot of information, but people have to know when to turn them on.
- NOAA Weather Radio can provide short messages of any impending weather hazard or emergency and advise people to turn on their radios or televisions, but not everyone has a Weather Radio.
- Outdoor warning sirens can reach many people quickly as long as they are outdoors. They do not reach people in tightly-insulated buildings or those around loud noise, such as in a factory, during a thunderstorm, or in air conditioned homes. They do not explain what hazard is coming, but people should know to turn on a radio or television.
- Automated telephone notification services are also fast, but can be expensive and do not work when phone lines are down. Nor do they work for unlisted numbers and calling screener services, although individuals can sign up for notifications.
- Where a threat has a longer lead time (e.g., flooding along the Vermilion River), going door-to-door and manual telephone trees can be effective.

#### NOAA Weather Radios All Hazards (NWR)

NWR is a nationwide network of radio stations that broadcasts warnings, watches, forecasts and other hazard information 24 hours a day. For Livingston County, information comes from the National Weather Service office in Romeoville, Illinois.

NOAA Weather Radios can be very effective for notifying people, businesses, schools, care facilities, etc., of weather threats. They have a monitoring feature that issues an alarm when activated by the National Weather Service.

**StormReady:** Just as important as issuing a warning is telling people what to do. A warning program should have a public information aspect. People need to know the difference between a tornado warning (when they should seek shelter in a basement) and a flood warning (when they should stay out of basements).



The National Weather Service established the StormReady program to help local governments improve the timeliness and effectiveness of hazardous weather-related warnings for the public. To be officially StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.



Being designated as a StormReady community by the Weather Service is a good measure of a community's emergency warning program for weather hazards.

**Local Implementation:** The City of Pontiac is a StormReady Community. The Livingston County ESDA and municipal emergency services are responsible for disseminating warning information to the public and notifying response personnel during an emergency. Once a threat is perceived, the County's 911 dispatch center then transmits the warnings to these offices and all first responders, as well as to schools, hospitals, government offices, businesses, and the general public through the following systems:

- The Emergency Alert Radio System (EARS) is a tone alert system designed to provide weather watch and warning information to schools, hospitals, government offices, business, and the general public.
- The Emergency Alert System (EAS) is a national warning system that utilizes broadcast radio, television stations, and local cable television systems. The Emergency Alert System Emergency Management Network (EMnet). This is a satellite based digital state-wide messaging system that allows users to send secure messages to all municipal Public Safety Answering Points, hospitals, and the County Health Department. In Livingston County, EMnet is available at the Livingston County Sheriff PSAP and at the Livingston County PSAP.

**Incorporated Areas:** Municipalities are responsible for installation, operation, notification to their citizens, and activation of their warning systems. Fire chiefs, police chiefs, and mayors may be authorized to activate these warning systems according to their emergency plans.

**Rural areas:** In the rural area, the population is urged to have weather alert radios and a battery operated AM/FM radio. Livingston County ESDA does not own or maintain any type of outdoor warning system. Therefore, most unincorporated areas do not have warning sirens. For rural and unincorporated areas, Livingston County ESDA holds that the most effective means of warning are radio, television, and cable systems (EAS); the EARS tone alert radios and NOAA Weather Radios.

**Special Needs Populations:** The hospitals, nursing homes, special needs homes, and animal care facilities in the county should have weather radios to monitor weather conditions.

## 7.3 Response

The protection of life and property is the foremost important task of emergency responders. Concurrent with threat recognition and issuing warnings, a community should respond with actions that can prevent or reduce damage and injuries. Typical actions and responding parties include the following:

- Activating the emergency operations center (emergency management)
- Closing streets or bridges (police or public works)
- Shutting off power to threatened areas (utility company)
- Passing out sand and sandbags (see photo) (public works)
- Ordering an evacuation (chief elected official)
- Holding children at school/releasing children from school (school district)
- Opening evacuation shelters (Red Cross)
- Monitoring water levels (engineering)
- Security and other protection measures (police)





An emergency action plan ensures that all bases are covered and that the response activities are appropriate for the expected threat. These plans are developed in coordination with the county agencies, offices and municipal first responders and have Standard Operating Guidelines for response.

Planning is best done with adequate data. One of the best tools is a flood stage forecast map that shows what areas would be under water at various flood stages. Emergency management staff can identify the number of properties flooded, which roads will be under water, which critical facilities will be affected, etc. With this information, an advance plan can be prepared that shows problem sites and determines what resources will be needed to respond to the predicted flood level.

Emergency response plans should be updated annually to keep contact names and telephone numbers current and to make sure that supplies and equipment that will be needed are still available. They should be critiqued and revised after disasters and exercises to take advantage of the lessons learned and changing conditions. The end result is a coordinated effort implemented by people who have experience working together so that available resources will be used in the most efficient manner.

**Local Implementation: Livingston County:** The Livingston County ESDA is responsible for the Emergency Operations Plan for the County. The chief elected official, County office holders, first responders in Livingston County (law enforcement, fire departments, EMS), County Highway Department, County Health Department, American Red Cross, County Mental Health Department, and County Animal Control are included in the emergency planning process. Livingston County ESDA is also responsible for the development of mutual aid agreements that can be executed during a natural or manmade hazard event. Mutual aid agreements have been developed between the County and municipalities for all municipal services.

**Municipalities:** Municipalities are responsible for their incorporated areas until all of their resources are exhausted. If the severity or extent of an emergency were to exceed any municipality's capability, in addition to County ESDA, MABAS and ILEAS will be able to provide additional resources and assistance. Six Livingston County municipalities and villages have or will have emergency operation plans. State law requires an update and revision every two years. So, many municipalities are currently in the process of plan development or revision.

## **7.4 Critical Facilities Protection**

Critical facilities are discussed in Chapter 1 and Chapter 2. Protecting critical facilities during a disaster is the responsibility of the facility owner or operator. However, if they are not prepared for an emergency, the rest of the community could be impacted. If a critical facility is damaged, workers and resources may be unnecessarily drawn away from other disaster response efforts. If such a facility is adequately prepared by the owner or operator, it will be better able to support the community's emergency response efforts.

Most critical facilities have full-time professional managers or staff who are responsible for the facility during a disaster. Some have their own emergency response plans. Illinois state law requires hospitals, nursing homes, and other public health facilities to develop such plans. Many facilities would benefit from early warning, response planning, and coordination with community response efforts.

**Local Implementation:** This Plan identifies all county-owned, municipal-owned buildings, schools, hospitals, nursing homes, and other public and private health facilities. However, neither the County's nor most of the municipal plans have procedures for coordination with critical facilities during a warning or emergency response or for helping facility managers develop their own emergency response plans.

## 7.5 Post-Disaster Recovery and Mitigation

After a disaster, communities should undertake activities to protect public health and safety, facilitate recovery and help prepare people and property for the next disaster. Throughout the recovery phase, everyone wants to get “back to normal.” The problem is, “normal” means the way they were before the disaster, exposed to repeated damage from future disasters.

Appropriate measures include the following:

### Recovery actions

- Patrolling evacuated areas to prevent looting
- Providing safe drinking water
- Monitoring for diseases
- Vaccinating residents for tetanus
- Clearing streets
- Cleaning up debris and garbage
- Regulating reconstruction to ensure that it meets all code requirements

### Mitigation actions

- Conducting a public information effort to advise residents about mitigation measures they can incorporate into their reconstruction work
- Evaluating damaged public facilities to identify mitigation measures that can be included during repairs
- Acquiring substantially or repeatedly damaged properties from willing sellers
- Planning for long term mitigation activities
- Applying for post-disaster mitigation funds

**Regulating Reconstruction:** Requiring permits for building repairs and conducting inspections are vital activities to ensure that damaged structures are safe for people to re-enter and repair.

There is a special requirement to do this in floodplains, regardless of the type of disaster or cause of damage. The National Flood Insurance Program (and the County's stormwater ordinance) requires that local officials enforce the substantial damage regulations. These rules require that if the cost to repair a building in the mapped floodplain equals or exceeds 50% of the building's market value, the building must be retrofitted to meet the standards of a new building in the floodplain. In most cases, this means that a substantially damaged building must be elevated above the base flood elevation.

This requirement can be very difficult for understaffed and overworked offices after a disaster. If these activities are not carried out properly, not only does the community miss a tremendous opportunity to redevelop or clear out a hazardous area, it may be violating its obligations under the NFIP.

**Local Implementation:** The Livingston County Planning and Zoning Department and each community that participates in the NFIP – and had mapped Special Flood Hazard Areas - are responsible for the enforcement of floodplain regulations. All parcels in the floodplain should be identified on the GIS mapping for future use.

## 7.6 Conclusions

1. The County has a good network of storm watchers.
2. The flood threat recognition system is best on the Vermilion River. For other streams, local officials have to augment the National Weather Service's (NWS) general statements of possible flooding and utilize the rain gage network.
3. The rain gage network in the County is very limited. Rainfall reports are available from the NWS's Romeoville office.
4. The threat recognition system for severe weather hazards (tornadoes, thunderstorms, and winter storms) for the County is inadequate, but as effective as the County can have for the cost.
5. The warning system for the County is limited. Warning systems do not exist for parts of the County, particularly in rural areas. Mobile home parks are without warning systems. Schools, hospitals, nursing homes, government buildings and some factories have NOAA Weather Radios All Hazards. There may be some critical facilities that do not have them.
6. Emergency response plans do not cover critical facilities that will be affected by various types of hazards.
7. There are no specific plans or guidance documents on post-disaster inspections and capitalizing on post-disaster mitigation opportunities.

## 7.7 Recommendations

1. All communities in Livingston County should strive to obtain StormReady designations.
2. The adequacy of existing outdoor and indoor warning systems should be evaluated and additional warning needs identified. Wherever possible, funding for improved warning systems should be obtained.
3. Continue to update emergency operations plans for the County, and continue to develop municipal emergency operations plans with a NIMS compliant template.
4. Response procedures for floods and other hazards should be incorporated in all emergency operations planning and response where appropriate. For example, public works department should pre-identify sandbag staging locations for residents.
5. All identified critical facilities in the County should be mapped using the County's GIS mapping for planning, warning and responses purposes. The County should continue their efforts to determine critical facilities located in flood prone areas.
6. Continue work for NIMS compliance for the County and all municipalities, and provide training on NIMS and ICS for all first responders and other identified personnel for compliance.
7. Emergency operations centers at the County and in municipalities should be evaluated for effectiveness and functionality, and modified appropriately. The County and all municipalities should have a fully operational emergency operations center and a secondary location.
8. Conduct annual emergency response training exercises. Look for multi-jurisdiction training opportunities.
9. Develop a disaster recovery strategy for the County and municipalities that includes the identification of mitigation efforts.
10. All parcels in the floodplain should be identified using the County's GIS mapping for planning, warning and response purposes.

11. Investigate adequacy and research funding opportunities for emergency warning and response equipment, including outdoor weather warning sirens, generators for critical facilities, and other warning systems.
12. Develop flood stage maps for the County's major streams to make use of gaging networks, warning systems and GIS mapping capabilities.
13. Research funding for additional rainfall and river gages. Also the County and communities should look to expand the National Weather Service observer's network.
14. Develop emergency transportation plans that allow for emergency coordination and evacuation (routing).

## 7.8 References

1. *Flood Fighting*, Illinois Department of Transportation, Division of Water Resources, 1985.
2. *Guidelines on Community Local Flood Warning and Response Systems*, Federal Interagency Advisory Committee on Water Data, 1985
3. Information on StormReady communities can be found on the National Weather Service website, [www.nws.noaa.gov/stormready/](http://www.nws.noaa.gov/stormready/)
4. *Post-Flood Mitigation Procedures*, Village of South Holland, Illinois, 1997.
5. Excelon Corporation – LaSalle Generation Station public information.
6. Survey of communities and County offices, 2010.

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## Chapter 8. Public Information

Public information activities are an integral part of hazard mitigation. Public information activities advise property owners, renters, businesses, and local officials about hazards that they face, and provide advice and tools that allow people to protect themselves and their property from natural and manmade hazards. A successful hazard mitigation program involves a public information strategy and involves both the public and private sectors. This chapter discusses public information outreach activities, ways to deliver public information, and elements of a comprehensive a public information strategy for hazard mitigation.

Hazards Addressed	
Y	Winter Storms
Y	Summer Storms
Y	Tornado
Y	Flood
Y	Extreme Heat
Y	Extreme Cold
Y	Transportation Incident
Y	Radiological Incident
Y	Utility Interruption
Y	Other Manmade Incident

### 8.1 Outreach Projects

Numerous government agencies and non-profit organizations publish public information and guidance regarding hazards and hazard mitigation. Other means of public information assistance include technical assistance from communities and library resources. None of these efforts are effective, however, if the information or the message does not reach people.



Dwight, Illinois, June 2010

An outreach project is an effort to ensure that information and resources reaches the appropriate person or groups. Outreach projects are the first step in the process of orienting property owners to property protection and assisting them in designing and implementing a project. They are designed to encourage people to seek out more information in order to take steps to protect themselves and their properties. Sending notices to property owners can help introduce the idea of property protection and identify sources of assistance.

Research has proven that outreach projects work. However, awareness of the hazard is not enough; people need to be told what they can do about the hazard, so

projects should include information on safety, health and property protection measures. Research has also shown that a properly run local information program is more effective than national advertising or publicity campaigns. Therefore, outreach projects should be locally designed and tailored to meet local conditions.

**Community newsletters/direct mailings:** The most efficient and effective type of outreach projects are those where information is mailed or distributed to everyone in the community or, in the case of floods, to floodplain property owners.

**News media:** Local newspapers can be strong allies in efforts to inform the public. Press releases and story ideas may be all that's needed to whet their interest. After a tornado in another community, people and the media become interested in their tornado hazard exposure and how to protect themselves and their property. Local radio stations and cable TV channels can also help. These media offer interview formats and cable companies may be willing to broadcast videos about the hazards.

**Other approaches:** Examples of other outreach project approaches include:

- School programs,
- Presentations at meetings of neighborhood, civic or business groups,
- Displays in public buildings or shopping malls,
- Signs in parks, along trails and on waterfronts that explain the natural features (such as the river) and their relation to hazards (such as floods),
- Brochures available in municipal buildings and libraries, and
- Special meetings such as floodproofing open houses.



**American  
Red Cross**

American Red Cross brochures can be ordered through the:

*American Red Cross of the Heartland  
One Westport Court  
Bloomington, IL 61704*

*Phone: 309-622-0500  
www.archeartland.org*

**Local implementation:** The American Red Cross has a variety of brochures and publications on safety measures to take for fires, floods, winter storms, heat, and other disasters. Their publications are tailored for different age groups.

Table 8-1 shows which Livingston County communities provide residents with a newsletter, offer a website, and/or provide technical assistance for floodplain management issues or addressing wind or snow hazards.

**Table 8-1  
Livingston County Public Information Activities**

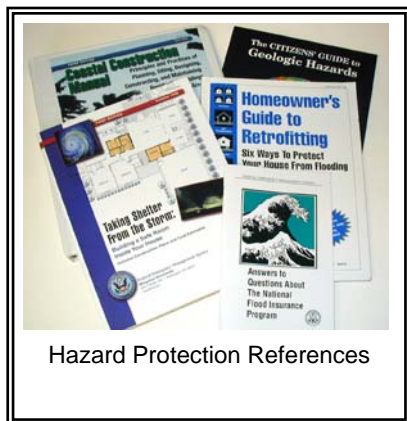
Community	Read NFIP maps (FIRM) for property owners?	Regular newsletter?	Public library?	Website?	Property visits for hazard protection advice?
Village of Campus	n/a				
Village of Chatsworth			Yes	Yes	
Village of Cornell	n/a				
Village of Cullom	n/a				
Village of Dwight	Yes		Yes	Yes	Upon Request
Village of Emington			Yes		Upon Request
City of Fairbury	Yes		Yes	Yes	
Village of Flanagan	n/a				
Village of Forrest	n/a		Yes		
Village of Long Point	n/a				
Village of Odell			Yes		
City of Pontiac			Yes	Yes	
Village of Saunemin				Yes	
Village of Strawn	n/a				
Reading Township	n/a	Yes	n/a		
Livingston County	Yes			Yes	Upon Request

## 8.2 Library and Web Sites

The community library and local web sites are obvious places for residents to seek information on hazards, hazard protection, and protecting natural resources. Books and pamphlets on hazard mitigation can be given to libraries, many of them obtained free from state and federal agencies. Libraries also have their own public information campaigns with displays, lectures, and other projects, which can augment the activities of the local government.



Today, web sites are becoming more popular as research tools. They provide quick access to a wealth of public and private sites and sources of information. Through links to other web sites, there is almost no limit to the amount of up-to-date information that can be accessed by the user.



In addition to on-line floodplain maps, websites can link to information for homeowners on how to retrofit for tornadoes, earthquakes and floods and a "FEMA for Kids" site. This website teaches children how to protect their home and what to have in a family disaster kit.

**Local implementation:** Communities with websites include Chatsworth, Dwight, Fairbury, Pontiac, Saunemin and Livingston County. The Livingston County Health Department maintains their own website at: [www.lchd.us](http://www.lchd.us).

At this time, none of the websites direct users to hazard information, although the County website under ESDA does contain links to IEMA and FEMA.

## 8.3 Technical Assistance

**Hazard information:** Many benefits stem from providing map information to inquirers. Residents and business owners that are aware of the potential hazards can take steps to avoid problems and/or reduce their exposure to flooding. Real estate agents and house hunters can find out if a property is floodprone and whether flood insurance may be required.

Communities can easily provide map information from FEMA's Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies. They may also assist residents in submitting requests for map amendments and revisions when they are needed to show that a building is outside the mapped floodplain.

Communities often supplement what is shown on the FIRM with maps that complement and clarify the FIRM and information on additional hazards, flooding outside mapped areas and zoning. When the map information is provided, community staff can explain insurance, property protection measures and mitigation options that are available to property owners. They should also remind inquirers that being outside the mapped floodplain is no guarantee that a property will never get wet.

**Property protection assistance:** While general information provided by outreach projects or the library helps, most property owners do not feel ready to retrofit their buildings without more specific guidance. Local building



department staffs are experts in construction. They can provide free advice, not necessarily to design a protection measure, but to steer the owner onto the right track.

Building or public works department staff can provide the following types of assistance:

- Visit properties and offer protection suggestions
- Recommend or identify qualified or licensed contractors
- Inspect homes for anchoring of roofing and the home to the foundation
- Provide advice on protecting windows and garage doors from high winds
- Explain when building permits are needed for home improvements

**Local implementation:** The Livingston County Zoning office provides advice and technical assistance to property owners and local government units for floodplain management. The Livingston County Health Department provides technical guidance related to septic system failure and well contamination.

Dwight, Emington, Fairbury and the County provide technical assistance for floodplain management issues and will visit properties to provide advice when requested.

## 8.4 Real Estate Disclosure

Many times after a flood or other natural disaster, people say they would have taken steps to protect themselves if only they had known they had purchased a property exposed to a hazard. Three regulations, one federal and two state, require that a potential buyer of a parcel be told of the property's vulnerability to a hazard.

*Federal law:* Federally regulated lending institutions must advise applicants for a mortgage, or other loan that is to be secured by an insurable building, that the property is in a floodplain as shown on the Flood Insurance Rate Map.

Flood insurance is required for buildings located within the base floodplain if the mortgage or loan is federally insured. However, because this requirement has to be met only 10 days before closing, often the applicant is already committed to purchasing the property when he or she first learns of the flood hazard.

*Illinois Residential Real Property Disclosure Act:* This law requires a seller to tell a potential buyer:

- If the seller is aware of any flooding or basement leakage problem
- If the property is located in a floodplain or if the seller has flood insurance
- If the seller is aware of a radon problem
- If the seller is aware of any mine subsidence or earth stability defects on the premises
- If the seller is aware of any structural defects

This State law is not wholly reliable because the seller must be aware of a problem and willing to state it on the disclosure form. Due to the sporadic occurrence of flood events, a property owner may legitimately not be aware of potential flooding problems with a property being sold or purchased. Practices by local real estate boards can overcome the deficiencies of these laws and advise newcomers about the hazard earlier. They may also

encourage disclosure of past flooding or sewer problems, regardless of whether the property is in a mapped floodplain.

The shortcoming of this approach is that it is dependent on the seller, not on an independent check of the flood map. Multiple Listing Service (MLS) entries read "Flood insurance may be required." This does not provide any help in disclosing the flood hazard.

*Illinois Compiled Statutes:* Chapter 55, Section 5/3-5029 requires that all subdivision plats must show whether any part of the subdivision is located in the 100-year floodplain.

## 8.5 Public Information Program Strategy

The development of a public information program strategy is a way to be sure that a community's public information efforts are effective. A public information program strategy involves the review of local conditions, local public information needs, and a recommended action plan of activities. A strategy should consist of the following parts, which are incorporated into this plan.

- The local hazards – discussed in Chapter 2 of this Plan.
- The property protection measures appropriate for a specific hazard – discussed in Chapter 5.
- Hazard safety measures appropriate for the local situation. Example for earthquake safety measures is shown on page 8-8 and 8-9.
- Flood safety measures appropriate for the local situation – discussed in the box on page 8-10.
- The public information activities currently being implemented within the communities, including those by non-government agencies – discussed in sections 8.1 through 8.3.
- Goals for the community public information programs are covered in Chapter 3.
- The outreach projects that will be done each year to reach the goals are section 8.7's recommendations and Chapter 9's Action Plan.
- The process that will be followed to monitor and evaluate the projects is in Chapter 9's Action Plan

Much of the above items are taken from FEMA's Community Rating System for the National Flood Insurance Program, but the strategy is useful and applicable for any hazard or mitigation outreach effort.

**Public information topics:** The Planning Committee worked through a list of potential public information topics and selected ten topics to focus initial efforts on. These selected topics are shown in the recommendations section of this chapter (8.7). Of note is the recommendation for more information on mosquito protection and eradication. This is due to the concern for the West Nile Virus. Safety is another important topic selected by the Committee, along with more information on earthquakes. The Committee agreed that while the area is aware of the earthquake hazard, little information has been provided to residents on earthquake safety or preparedness. As examples, pages 8-8 to 8-10 depict some of the available public information on earthquake preparedness and flood safety.

**Ways to disseminate public information:** The Committee also evaluated ways or methods of distributing the public information messages and materials. The top ten approaches are also presented in the recommendations section of this chapter (8.7).

## 8.6 Conclusions

1. Public information programs are important so that people and businesses are more aware of the hazards they face and how they can protect themselves. Some public information efforts are currently being implemented by Livingston County, Livingston County municipalities and townships, FEMA, IEMA, and the American Red Cross.
2. Community outreach projects, libraries and web sites can reach a lot of people, but more information needs to be provided on natural hazards.
3. Mitigation efforts are being implemented by communities (e.g., building codes and planning efforts), but little information is being provided to property owners to describe these current mitigation activities and actions.
4. The Planning Committee assessed a variety of topics and determined that for Livingston County the most important topics to cover in public information activities are:
  - Emergency protection measures
  - Safety precautions during storms and tornadoes
  - Safety hazards during and after floods
  - Protecting property against flood damage
  - Water quality issues
5. Mitigation and hazard protection message need to reach:
  - The general public
  - Floodplain residents
  - Developers and builders
  - Decision makers
  - Schools and teachers
6. All communities in Livingston County need to implement public information activities.

## 8.7 Recommendations

1. Each County office, municipality and township should review their current public information activities and, at a minimum, incorporate the messages and audiences listed in Section 8.6 in them, when and where appropriate.
2. Publications developed by other agencies should be reviewed, consolidated, and tailored for distribution to Livingston County property owners. A set of countywide publications should be developed that can be used by communities as is, but developed in a format that allows communities to customize the material.
3. Community newsletters, newspapers, web sites, handouts, and mailings should be used to convey these messages. They are listed here in priority order as recommended by the Mitigation Committee.
4. Public information for hazard mitigation should be coordinated with the Livingston County Health Department in order to combine resources and messages for natural hazards and health concerns related to pandemics or disasters.

5. Listing of free hazard mitigation education materials should be provided for communities and local libraries to order free state and federal hazard mitigation publications.
6. Sample articles, with illustrations, on these topics should be prepared and distributed to all interested parties, such as public information offices, webmasters, permit offices, reception desks, and neighborhood organizations.
7. Community web sites should include information and links to other sites to cover as many topics as possible.
8. Communities in the National Flood Insurance Program should provide floodplain information for property owners.
9. All residents and business owners in Livingston County should be educated on the importance of sheltering and saferooms for protection during high wind and tornado events.

## 8.8 References

1. Community surveys, 2010.
2. *Are You Ready? A guide to Citizen Preparedness*, FEMA, 2002.
3. *Floodproof Retrofitting: Homeowner Self-Protective Behavior*, Shirley Bradway Laska, University of Colorado, 1991.
4. *Protecting Nature in Your Community*, Chicago Wilderness and Northeastern Illinois Planning Commission, 2000.
5. *Stormwater Management Public Information Resource Guide*, South Suburban Mayors and Managers Association, 1999.

## ***Duck, Cover and Hold***

Whether you are in your home, a school classroom, a high-rise or other type of building, it is important to know how to protect yourself during an earthquake. Practice what to do during an earthquake with your family members so you can react automatically when the shaking starts. If you are outdoors when the shaking starts, get into an open area away from trees, buildings, walls and power lines. If you are indoors follow these steps:

### **Duck**

Duck or drop down to the floor.

### **Cover**

Take cover under a sturdy desk, table or other furniture. If that is not possible, seek cover against an interior wall and protect your head and neck with your arms. Avoid danger spots near windows, hanging objects, mirrors or tall furniture.

### **Hold**

If you take cover under a sturdy piece of furniture, hold on to it and be prepared to move with it. HOLD the position until the ground stops shaking and it is safe to move.



## ***Earthquake Preparedness Before, During and After***

There are many things you can do to help yourself in the event of an earthquake. Generally, an earthquake is divided into three stages: before, during and after. Know what to do in each stage.

### **Before**

- Develop a family earthquake plan. Prepare yourself and your home by completing the activities on this checklist.
- Decide how and where your family will reunite if separated.
- Choose an out-of-area friend or relative who separated family members can call after the quake to report their whereabouts and condition.
- Know the safe spots in each room: under sturdy tables, desks, or against inside walls.
- Know the danger spots: windows, mirrors, hanging objects, fireplaces and tall, unsecured furniture.
- Conduct practice drills. Physically place yourself in safe locations.
- Learn first aid and CPR (cardiopulmonary resuscitation) from your local American Red Cross chapter or other community organization.
- Keep a list of emergency phone numbers.
- Learn how to shut off gas, water and electricity in case the lines are damaged. (Safety note: Do not attempt to relight a gas pilot).
- Secure water heaters and appliances that could move enough to rupture lines.
- Secure heavy furniture, hanging plants, heavy pictures or mirrors.
- Keep flammable or hazardous liquids in cabinets or on lower shelves.
- Maintain emergency food, water and other supplies, including a flashlight, a portable battery-operated radio, extra batteries, medicines, first aid kit and clothing.

## *Earthquake Preparedness Before, During and After - continued*

### **During**

- If indoors, stay there and take cover under a table, desk, or other sturdy furniture.
- Face away from windows and glass doors.
- A doorway without a door is an acceptable location in which to stand.
- Lie, kneel or sit near a structurally sound interior wall or corner away from windows, brick fireplaces, glass walls, etc.
- Protect your head and body from falling or flying objects.
- Remain where you are until shaking stops. Think out your plan of action first, then move.
- Know exit routes if in a commercial building. Take cover and don't move until the shaking stops.
- If outside, get into an open area away from trees, buildings, walls and power lines.
- Lie down or crouch low to maintain balance.
- Get to the best available shelter if there is no open area available.
- If driving, stop safely as soon as possible. Stay inside your vehicle until the shaking stops.
- Do not stop your vehicle under overpasses or bridges.
- Stay below window level in your vehicle.
- Turn off the engine and turn on the radio. Follow emergency instructions.
- Stay in the vehicle if downed power lines have fallen across it. Do not touch metal. Wait for help. You might be able to back away from lines.
- If you have to leave your vehicle, move to an open area quickly.

### **After**

- Check for injuries. Render first aid. Do not move seriously injured victims unless they are in immediate danger. Do not use the telephone immediately unless there is a serious injury, fire or other emergency. Hunt for hazards.
- Check for other hazards and control them (fire, chemical spills, toxic fumes and possible collapse).
- Check utilities (water, gas, electric). If there is damage, turn the utility off at the source.
- Check for other hazards and control them (fire, chemical spills, toxic fumes and possible collapse).
- Check building for cracks and damage, including roof, chimneys, and foundation.
- Check food and water supplies.
- Emergency water can be obtained from water heaters, melted ice cubes, canned vegetables, and toilet tanks.
- Never use matches, lighters or candles inside.
- Turn on the radio and listen for emergency broadcasts/announcements, news reports, and instructions. Cooperate with public safety officials.
- Do not use your vehicle unless there is an emergency. Keep the streets clear for emergency vehicles.
- If buildings are suspect, set up your shelter area away from damage.
- Work with your neighbors for a quicker recovery. Stay calm and lend a hand to others.
- Be prepared for aftershocks.
- Plan for evacuation in case events make this necessary. Leave written messages for other family members or searchers.
- Use gloves, wear heavy shoes, and have adequate and appropriate clothing available.

Source: Illinois Emergency Management Agency  
[www.state.il.us/Prep/earthquake.htm](http://www.state.il.us/Prep/earthquake.htm)

## ***Flood Safety***

Do not walk through flowing water. Drowning is the number one cause of flood deaths. Currents can be deceptive; six inches of moving water can knock you off your feet. Use a pole or stick to ensure that the ground is still there before you go through an area where the water is not flowing.

Do not drive through a flooded area. More people drown in their cars than anywhere else. Don't drive around road barriers; the road or bridge may be washed out.

Stay away from power lines and electrical wires. The number two flood killer after drowning is electrocution. Electrical current can travel through water. Report downed power lines to the Police or Sheriff by calling 911.

Look out for animals that have been flooded out of their homes and who may seek shelter in yours. Use a pole or stick to poke and turn things over and scare away small animals.

Look before you step. After a flood, the ground and floors are covered with debris including broken bottles and nails. Floors and stairs that have been covered with mud can be very slippery.

Be alert for gas leaks. Use a flashlight to inspect for damage. Don't smoke or use candles, lanterns, or open flames unless you know the gas has been turned off and the area has been ventilated.

Carbon monoxide exhaust kills. Use a generator or other gasoline-powered machine outdoors. The same goes for camping stoves. Charcoal fumes are especially deadly -- cook with charcoal outdoors.

Clean everything that got wet. Flood waters have picked up sewage and chemicals from roads, farms, factories, and storage buildings. Spoiled food, flooded cosmetics, and medicine can be health hazards. When in doubt, throw them out.

Take good care of yourself. Recovering from a flood is a big job. It is tough on both the body and the spirit and the effects a disaster has on you and your family may last a long time.

## Chapter 9. Action Plan

### 9.1 Action Plan Overview

The findings, conclusions and recommendations of the *Livingston County All Hazards Mitigation Plan* (Plan) have been used to create this Action Plan. The Action Plan represents the priority recommendations that should be implemented as part of the Livingston County mitigation program as staff and financial resources become available. Action items presented in this Chapter have been developed for the County and for the municipalities and townships to consider for implementation.

**Plan Recommendations:** The complete set of recommendations for this Plan appears at the end of Chapters 4 through 8 for the mitigation strategies analyzed (preventive measures, property protections, structural measures, emergency services, and public information). Any recommendations presented in the Plan may be selected for implementation as resources become available (e.g., federal, state and/or local funding). This chapter presents selected recommendations for implementation as priority action items. *Recommendations in this Plan that were not selected for this Action Plan are no less important and should be funded and/or implemented as resources become available.* Some recommendations, for example, not included in the action items below may become priority actions following a natural or manmade hazard event or a federal disaster declaration.

**Selection of Action Items:** Recommendations selected as priority action items were deemed as being both necessary and feasible over the course of the next years by the Mitigation Committee. Feasibility was based on current County and municipal resources and currently available grant funding from state and federal agencies. The Mitigation Committee initially selected action items at their September 2010 meeting, then reviewed the Action Plan in its entirety at their October 2010 meeting.

The action items included in this Action Plan support the goals and guidelines for this *Livingston County All Hazards Mitigation Plan* (Chapter 3). The action items call for both the continuation of current mitigation efforts throughout the County, and the initiation of new mitigation activities. Continued compliance with the NFIP is called for in Action Item 9, and improved understanding of the County's flood problem areas is also incorporated into a number of other action items.

**Organization, Prioritization and Assignment of Action Items:** The action items presented in Section 9.2 have been placed into three groups: administrative action items, mitigation program activities, and public information activities. The action items are prioritized within the order that they are presented for each of those three groups. The administrative action items include actions for plan maintenance, and other details of plan maintenance are discussed in Section 9.4. Most mitigation program activities apply to all communities, though some are applicable to only the municipalities that participate in the NFIP. Since the goals and guidelines place emphasis on health and safety, emphasis has been placed on public information activities.

The action items listed below assign recommended projects and deadlines to the appropriate agencies. Each action item starts with a short description. The next four subheadings list the responsible agency, the estimated deadline or timeframe for accomplishing the action item, the costs and the benefits. The action items are summarized in Table 9-1 and show the agency assignments. Table 9-4 provides action items assigned to each participating jurisdiction.



## 9.2 Mitigation Action Items

### Administrative Action Items

#### Action Item 1: Plan Adoption

Adopt this *Livingston County All Hazards Mitigation Plan* by resolution. The adopting resolutions should adopt each action item that is pertinent to the County/community and assign a person or department responsible for its implementation.

*Responsible agency:* County Board, Village Boards, City Councils, Boards of Trustees.

*Deadline:* Six months after date of Plan publication.

*Cost:* Staff time.

*Benefits:* Formal adoption of the Plan ensures that County and municipal/township staffs are authorized and instructed to implement the action items.

#### Action Item 2: Continuation of the Hazard Mitigation Planning Committee

The Livingston County Hazard Mitigation Planning Committee will be converted to a permanent advisory body to Livingston County in the County's resolution to adopt this Plan. The Hazard Mitigation Planning Committee would:

- Act as a forum for hazard mitigation issues,
- Disseminate hazard mitigation ideas and activities to all participants,
- Allow for continued public participation in the implementation and future revisions,
- Ensure incorporation of this Plan's goals and guidelines into other planning documents,
- Monitor implementation of this Action Plan, and
- Report on progress and recommended changes to the County Board and each municipality.

*Responsible agency:* County Board and the Livingston County Hazard Mitigation Planning Committee.

*Deadline:* Ongoing.

*Cost:* Staff time.

*Benefits:* This action item will lead to better implementation of this Plan, plus a more comprehensive mitigation program in Livingston County. This approach also provides a mechanism for continued public involvement (e.g., Committee activities posted on County website).

#### Action Item 3: Plan Monitoring and Maintenance

A Hazard Mitigation Planning Committee meeting will be held at least once a year to evaluate and monitor Plan implementation. This meeting will be publicized in local newspapers and/or on the County and community websites (the public will be welcome to attend and/or comment). An annual report will be developed and be distributed to the County Board by the chair of the Hazard Mitigation Planning Committee.

At the annual meeting, along with an assessment of the implementation efforts, the Committee will determine if other mitigation issues or efforts, based on any natural or manmade hazard occurrences or input from communities or the public, should be added to the Plan. Any substantive revisions to the Plan, in particular, to the Action Plan, must be adopted by the County Board and the participating communities and institutions.

The Hazard Mitigation Planning Committee will update the Plan every five years.

*Responsible agency:* The Hazard Mitigation Planning Committee and the Livingston County ESDA office.

*Deadline:* Annual reports to be issues on the anniversary of the date the Plan is adopted by the County Board. A five year update is required for FEMA's mitigation funding programs.

*Cost:* Staff time.

*Benefits:* The meetings and the annual report will help ensure that responsible agencies are continuing with implementation. Plan implementation should be evaluated in light of progress, changed conditions, available staff, available funding, and new opportunities.

## **Mitigation Program Action Items**

### **Action 4:** Consideration of Building Codes

Communities that do not currently implement building codes for new construction should consider adopting the International Codes series. Communities that do currently enforce building codes should consider if residential and commercial code revisions should be pursued to strengthen new buildings against damage by high winds, tornadoes hail, and earthquakes.

Requiring tornado saferooms in certain structures should be considered by all communities, especially with the development of senior living facilities, child care centers and schools.

Additional training for building department staff on building code administration, enforcement, the natural hazards aspects of the International Codes, regulation of mobile home installation, floodplain ordinances, should also be considered.

*Responsible agency:* Livingston County and municipalities.

*Deadline:* Ongoing.

*Cost:* Staff time.

*Benefits:* This will improve the hazard protection standards for new construction and will ensure a more consistent set of building standards across the County. Adoption of the IRC and IBC will protect against damages that are likely to occur during natural hazards. The benefits of saferooms can be measured in lives and safety. Building codes cannot be effective unless they are administered and enforced properly. Training will ensure that County and municipal staffs understand the codes and procedures. This is a benefit that property owners will also benefit from if they understand the importance of the building standards for new construction, and will allow them to protect their investment in the property.

*Plan Reference:* Chapter 4 discussion and recommendation 2 in Section 4.14.

### **Action 5:** Continued Compliance with the NFIP

Municipalities that participate in the National Flood Insurance Program (NFIP) and have FEMA-identified Special Flood Hazard Areas should ensure that they are in full compliance with the NFIP administration and enforcement requirements.

*Responsible Agency:* Livingston County Planning and Zoning Department and municipal NFIP Administrators (Dwight, Fairbury, Forrest, Long Point, Pontiac, Saunemin and Livingston County).

*Deadline:* Ongoing.

*Cost:* Staff time.

*Benefits:* Community compliance with the NFIP is essential.

*Plan Reference:* Chapter 4, discussion and recommendation 8 in Section 4.8.

**Action 6:** Consideration of Safety Requirements for Manufactured Home Communities

Safety-related requirements for manufactured (mobile) home communities and for the placement of manufactured homes should be considered, including the requirement for the construction of a saferoom/shelter for mobile home communities, and full enforcement of the Illinois Mobile Home Act and the Manufactured Home Tiedown Code managed by the Illinois Department of Public Health for all mobile homes. Attention should also be given to the manufactured home's proximity to a mapped floodplain and ensure that it the home is placed in a floodplain that it is properly elevated above the 100-year flood elevation.

*Responsible agency:* Livingston County and municipalities.

*Deadline:* Ongoing.

*Cost:* Staff time.

*Benefits:* Efforts to protect manufactured homes and their residents will protect against injuries and loss of life due to windstorms, tornadoes and floods.

*Plan Reference:* Chapter 4 discussion and recommendation 3 in Section 4.14.

**Action 7:** Drainage System Maintenance

The County and municipalities, and potentially the road districts, should develop and implement formal and regular drainage system maintenance programs. This effort should include the inspection of privately maintained drainage facilities. It is understood that each municipality (and road district) will make these considerations based on available staffing and financial resources. Both urban and rural streams are in need of maintenance. Also, bridges and culverts (active or abandoned) that restrict flood flows should be evaluated. The removal or enlargement of stream crossings, in cases where a modification will not cause an increase in downstream flooding, should be considered and funded.

*Responsible agency:* Livingston County and municipalities (and road districts).

*Deadline:* 24 months.

*Cost:* Project specific.

*Benefits:* Development and agriculture have lead to a reduction of stream capacity, and upstream flooding as a result may be increasing. A restoration of stream capacity may mitigate upstream damage, and enhance stream and water quality. Regular maintenance can protect both structures and property. Regular maintenance can also be more cost effective than major maintenance efforts that are done on an as-needed basis.

*Plan Reference:* Chapter 6 discussion and recommendation 3 in Section 6.7.

**Action 8:** Infrastructure Improvements

Infrastructure improvements are needed throughout the County. As bridges, road shoulders, sewers, streets, sewer systems, well septic systems, and surface water drainage are considered for improvement, hazard mitigation considerations should be made, and an assessment of potential mitigation funding for the improvement conducted. When appropriate, mitigation funding for a portion of the project cost should be pursued.

*Responsible agency:* County, municipalities, townships, and road districts.

*Deadline:* Ongoing.

*Cost:* Staff time.

*Benefits:* If infrastructure is built with hazard mitigation considerations, then its infrastructure is better protected from natural and manmade hazard events, and risk to life, health and safety is reduced.

*Plan Reference:* Chapter 6 discussion and the recommendation in Section 6.7.

#### Action 9: Mitigation for Floodplain Properties and Critical Facilities

The number of structures within the 100-year floodplains should be determined in detail, and mitigation opportunities for those structures should be identified. The County or municipalities should seek a mitigation planning grant as needed for preparing flood mitigation plans. Repetitive flood loss areas that have been identified in the Plan should be investigated and mitigated. Critical facilities in the floodplain should also be investigated and mitigated.

As structures in the 100-year floodplain are investigated, funding assistance from IEMA/FEMA for cost-effective mitigation alternatives should be pursued (acquisition, elevation or floodproofing). Priority should be given to repetitive flood loss structures and critical facilities.

*Responsible agency:* Livingston County Planning & Zoning and municipalities.

*Deadline:* 36 months.

*Cost:* Staff time, plus \$100,000 for planning, and project specific.

*Benefits:* The removal or protection of structures in the floodplain will benefit all levels of government.

*Plan Reference:* Chapter 5 discussion and recommendations 2 and 3 in Section 5.7.

#### Action 10: Grant Funding for Saferooms

Pursue grant funding for the construction of saferooms, in homes, businesses, at critical facilities, health care facilities, and schools. The first priority for any available funding should be schools. As needed, an investigation into the best alternative for creating saferooms for schools and other facilities should be conducted prior to the selection of a building alternative.

*Responsible agency:* Livingston County, municipalities, and school districts.

*Deadline:* 36 months.

*Cost:* Project specific.

*Benefits:* Livingston County is vulnerable to tornado events. With the construction of saferooms, life and safety can be protected.

*Plan Reference:* Chapter 5 discussion and recommendations 4 and 5 in Section 5.7.

#### Action 11: NIMS Compliance

Continue work for NIMS compliance for the County and all municipalities, and provide training on NIMS and ICS for all first responders and other identified personnel for compliance.

*Responsible agency:* Livingston County and municipalities.

*Deadline:* ongoing.

*Cost:* None.

*Benefits:* Emergency services – preparedness, response and recovery – can be improved if all officials are properly trained.

*Plan Reference:* Chapter 7 discussion and recommendation 6 in Section 7.7.

Action Item 12: Participation in StormReady:

Livingston County and municipalities should join, or maintain their status in, the National Weather Service's StormReady program. The StormReady program has been developed to provide communities guidelines to improve the timeliness and effectiveness of hazardous weather-related warning for the public.

*Responsible agency:* County and municipalities.

*Deadline:* 24 months.

*Cost:* \$2 per capita, staff time.

*Benefits:* By meeting StormReady requirements, the County and municipalities are able to detect impending weather hazards and disseminate warnings as quickly as possible. All efforts to prevent injury, save lives, and protect property are of high value.

*Plan Reference:* Chapter 7 discussion and recommendation 1 in Section 7.7.

Action 13: Improved Hazard Threat Recognition

Continued Compliance with the NFIP *Responsible agency:* Livingston County and municipal ESDAs.

*Deadline:* 24 months.

*Cost:* Unknown.

*Benefits:* With the exception of radios and other police and fire communication networks, Livingston County has limited warning systems. Outdoor warning systems are inadequate for the County. The lives, health and safety of people would be better protected with effective outdoor warning systems.

*Plan Reference:* Chapter 7 discussion and recommendation 2 in Section 7.7.

Action 14: Critical Facilities Design with All Hazards Protection

Offices responsible for design, construction or permitting critical facilities, including federal, state, county and municipal agencies, should ensure that the design or modification of critical facilities accounts for natural and manmade hazards and adjacent land uses.

*Responsible agency:* County, municipal, and federal and state agencies responsible for critical facilities.

*Deadline:* Ongoing.

*Cost:* Staff time.

*Benefits:* This Plan expanded the list of critical facilities to include school, places of assembly, and other assets that are significant in the county during times of natural or manmade disasters. These may be shelters, or places of concentrated populations. If these facilities are better protected, then the risk for life, health and safety is reduced.

*Plan Reference:* Chapter 4 discussion and recommendation 4 in Section 4.14 and Chapter 5 discussion and recommendation 8 in Section 5.7.

**Action 15:** Include the *All Hazards Mitigation Plan* into Other Plans

As the County and municipalities develop or revise comprehensive or land use plans, emergency operations plans, and ordinances, the goals and guidelines of this Plan should be incorporated into those efforts.

*Responsible agency:* Livingston County and municipalities.

*Deadline:* Ongoing.

*Cost:* Staff time.

*Benefits:* This will ensure that Livingston County takes a consistent approach to natural and manmade hazard mitigation, and develops other plans with the protection of life, health, safety, business and property protection in mind.

*Plan Reference:* Chapter 4 discussion and recommendation 1 in Section 4.14.

**Public Information Action Items**

**Action 16:** Information for Floodplain Property Owners

Property owners in floodplains should be provided with information and advice on property protection measures, including flood insurance. Special attention should be given to repetitive loss and high hazard areas.

*Responsible agency:* Livingston County and municipalities in the NFIP.

*Deadline:* 18 months.

*Cost:* Staff time.

*Benefits:* It is beneficial for people to be aware of hazards that may impact them and their neighbors.

*Plan Reference:* Chapter 8 discussion and recommendation 3 in Section 8.7.

**Action 17:** Educate Property Owners on Saferooms

Use available brochures and other information to educate residents, businesses, school communities and other property owners about saferooms for tornados. Encourage retrofitting of existing buildings to include saferooms, and the construction of saferooms in new building designs.

*Responsible agency:* The Hazard Mitigation Planning Committee, Livingston County, municipalities, and school districts.

*Deadline:* 18 months.

*Cost:* Staff time.

*Benefits:* Livingston County is vulnerable to tornado events and saferooms used in other parts of the country have proven effective. Encouraging property owners, including the owners of manufactured home communities, private schools, businesses, and medical facilities, to include saferooms in their buildings will protect lives.

*Plan Reference:* Chapter 8 discussion and recommendation 4 in Section 8.7.

**Action 18:** Develop Livingston County Public Information Materials for Hazard Mitigation

Collect available hazard mitigation information and tailor the information to Livingston County hazards addressed in the Plan with a focus on:

- Understanding warning signals

- Emergency protection measures
- Safety precautions during and after tornados, severe summer ad severe winter storms, and floods
- Health hazards related to natural and manmade hazards
- Protecting water quality
- What the County and municipalities are doing for hazard mitigation

These materials should be suitable for County, municipal, school, and private office use in presentations, articles, web pages and other printed materials.

*Responsible agency:* Livingston County and the Livingston County Hazard Mitigation Planning Committee. The American Red Cross could provide technical advice. Available funding from IEMA should be pursued for this effort.

*Deadline:* 18 months.

*Cost:* Staff time.

*Benefits:* By preparing articles and materials tailored to Livingston County, the messages will be technically correct and consistent throughout the County.

*Plan Reference:* Chapter 8 discussion and recommendation 1 in Section 8.7.

#### Action Item 19: Disseminate Public Information Materials on Hazard Mitigation

Disseminate hazard mitigation public information using the materials developed in Action Item 16. Dissemination, or outreach mechanisms, should include articles, news releases, directed mailings, handouts, websites, magnets and displays. The appropriate materials and appropriate media should be used for the following target audiences:

- The general public
- Floodplain residents
- Developers and builders
- Decision makers
- Schools and teachers

*Responsible agency:* The Hazard Mitigation Planning Committee, and Livingston County. The American Red Cross should also participate.

*Deadline:* 12 months.

*Cost:* Most projects will only cost staff time, such as newsletter articles and websites. Others, such as directed mailings and brochures, will have printing and/or postage expenses.

*Benefits:* There are many benefits to having a well-informed public. For example, deaths from lightning have steadily decreased over the years because people are more aware of what they should and should not do. More self-help and self-protection measures will be implemented if people know about them and are motivated to pursue them.

*Plan Reference:* Chapter 8 discussion and recommendation 2 in Section 8.7.

#### Action 20: Property Protection Library – Available Free Resources

To accompany the hazard mitigation information tailored to Livingston County, provide County and municipal offices, libraries and other interested groups with a list of references on property protection that can be ordered

for free from state and federal offices and the American Red Cross. Ordered materials can also be used prior to the development of information being developed specifically for Livingston County.

A special effort should be made to identify references on insurance, emergency preparedness and property protection. Also, identify websites that provide property protection information and provide their addresses to the County and municipal webmasters.

Reference or library materials should be displayed at County and municipal offices and community libraries.

*Responsible agency:* Livingston County and the Livingston County Hazard Mitigation Planning Committee. The American Red Cross should provide technical advice.

*Deadline:* 12 months.

*Cost:* Staff time.

*Benefits:* As with the other public information activities, this action item helps inform the public. It provides the greatest assistance to those people who want to learn more about property protection and take the right steps to reduce their exposure to damage by natural hazards.

*Plan Reference:* Chapter 8 discussion and recommendation 5 in Section 8.7.

## 9.3 Summary of Action Plan Items

Table 9-1 summarizes the 18 action items, the responsible agencies and the deadlines for implementing them. The action items are categorized as Plan administrative items, mitigation program items, and public information items. Table 9-4 provides a list of specific action items assigned to the Mitigation Committee, the County and communities.

The relationship between the goals and guidelines (from Chapter 3) are shown in Table 9-2 and Table 9-3 show the relationship of Plan recommendations (Chapter 4 through 8) to the action items.

## 9.4 Plan Implementation and Maintenance

The continuation of the Hazard Mitigation Planning Committee is necessary to ensure that the Action Plan is carried out. The Hazard Mitigation Planning Committee will monitor the implementation of the Plan, report to the County Board and municipalities on its progress, and recommend revisions to this Plan, as needed. This is explained in Action Items 2 and 3.

Maintenance and monitoring of the *Livingston County All Hazards Mitigation Plan* are addressed in the Action Item 3. This action item explains how and when this Plan will be reviewed, revised, and updated. While Action Item 3 calls for the Hazard Mitigation Planning Committee to meet at least once a year, it is anticipated that they will meet more frequently as mitigation and stormwater activities are pursued.



Table 9-1 Action Items, Responsible Agencies and Deadlines

Responsible Agency	Administrative			Mitigation Program												Public Information				
	1. Plan Adoption	2. Continuation of Hazard Mitigation Planning Committee	3. Plan Maintenance and Monitoring	4. Consideration of Building Codes	5. Continued Compliance with the NFIP	6. Consideration of Safety Requirements for Manufactured Home Communities	7. Drainage System Maintenance	8. Infrastructure Improvements	9. Mitigation for Floodplain Properties and Critical Facilities	10. Grant Funding for Safe Rooms	11. NIMS Compliance	12. Participation in StormReady	13. Improved Threat Recognition	14. Critical Facility Design with All Hazards Protection	15. Include the All Hazards Plan into Other Plans	16. Information for Floodplain Property Owners	17. Educate Property Owners on Safe Rooms	18. Develop Livingston Co. Public Info. Materials for Hazard Mitigation	19. Disseminate Public Information Materials on Hazard Mitigation	20. Property Protection Library – Available Free Resources
<b>Hazard Mitigation Committee</b>		✓	✓													✓	✓	✓	✓	✓
<b>Livingston County</b>																				
County Board	✓	✓		✓	☐	✓									✓					
ESDA			✓						✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Planning & Zoning				✓	☐	✓					✓				✓	✓	✓			
Transportation							✓	✓	✓		✓			✓						
Health									✓		✓			✓			✓			
<b>Municipalities</b>											☐									
City Council/Village Board	✓			✓	☐	✓					✓			✓	✓					
Administrator/Supervisor			✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Emergency Management			✓						✓		✓	✓	✓	✓		✓	✓	✓	✓	✓
NFIP Municipalities*									✓					✓	✓	✓				
Libraries									☐					☐	☐	☐			✓	✓
Other Department(s)							✓	✓	✓					✓			✓			
<b>Townships (Reading)</b>	✓		✓				☐	✓			✓			✓						
<b>Other Agencies</b>																				
Road Districts							✓	✓	✓					✓						
Schools									✓	✓	☐			✓			✓		✓	✓
<b>American Red Cross</b>																✓	✓	✓	✓	✓
Deadline for first product (months)	6	On	On	On		On	24	24	36	36	On	24	24	On	On	18	18	18	18	12

(x) Can be recommended

\* NFIP municipalities include: Dwight, Fairbury, Pontiac, and Livingston County

"On" denotes ongoing activity

	Administrative			Mitigation Program												Public Information				
Responsible Agency	1. Plan Adoption	2. Continuation of Hazard Mitigation Planning Committee	3. Plan Maintenance and Monitoring	4. Consideration of Building Codes	5. Continued Compliance with the NFIP	6. Consideration of Safety Requirements for Manufactured Home Communities	7. Drainage System Maintenance	8. Infrastructure Improvements	9. Mitigation for Floodplain Properties and Critical Facilities	10. Grant Funding for Safe Rooms	11. NIMS Compliance	12. Participation in StormReady	13. Improved Threat Recognition	14. Critical Facility Design with All Hazards Protection	15. Include the All Hazards Plan into Other Plans	16. Information for Floodplain Property Owners	17. Educate Property Owners on Safe Rooms	18. Develop Livingston Co. Public Info. Materials for Hazard Mitigation	19. Disseminate Public Information Materials on Hazard Mitigation	20. Property Protection Library – Available Free Resources
<b>Goals</b>																				
1. Protect the lives, health, and safety of the people and animals of Livingston County from the impact and effects of natural and manmade hazards.	✓	✓	✓	✓	□	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Protect public services and critical facilities from loss of use during, and potential damage from, natural and manmade hazard events.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓	□	✓	✓	✓	✓	✓
3. Mitigate to protect against economic and transportation losses due to natural and manmade hazards.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Ensure that new developments do not create new exposures to damage from natural and manmade hazards.	✓	✓	✓	✓	□	✓	□	□	□	□	□	□	□	✓	□	✓	✓	✓	✓	✓
5. Identify specific projects to protect lives and mitigate damage where cost-effective and affordable.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Protect historic, cultural, and natural resources from the effects of natural and manmade hazards.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 9-2 - Continued - Action Items, Goals and Guidelines

	Administrative			Mitigation Program												Public Information				
Responsible Agency	1. Plan Adoption	2. Continuation of Hazard Mitigation Planning Committee	3. Plan Maintenance and Monitoring	4. Consideration of Building Codes	5. Continued Compliance with the NFIP	6. Consideration of Safety Requirements for Manufactured Home Communities	7. Drainage System Maintenance	8. Infrastructure Improvements	9. Mitigation for Floodplain Properties and Critical Facilities	10. Grant Funding for Safe Rooms	11. NIMS Compliance	12. Participation in StormReady	13. Improved Threat Recognition	14. Critical Facility Design with All Hazards Protection	15. Include the All Hazards Plan into Other Plans	16. Information for Floodplain Property Owners	17. Educate Property Owners on Safe Rooms	18. Develop Livingston Co. Public Info. Materials for Hazard Mitigation	19. Disseminate Public Information Materials on Hazard Mitigation	20. Property Protection Library – Available Free Resources
<b>Guidelines</b>																				
1. Focus natural hazards mitigation efforts on floods, tornadoes, severe summer storms, severe winter storms, and extreme cold and heat events.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Focus manmade hazard mitigation efforts on utility interruption, transportation related incidents, hazardous material incidents and radiological release incidents.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Make people aware of the hazards they face and focus mitigation efforts on measures that allow residents and property owners to help themselves.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Create and foster public-private partnerships to accomplish mitigation activities.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Seek state, and federal support for mitigation efforts.	✓	✓	✓	□	□	□	✓	✓	✓	✓	□	□	✓	✓	□	□	□	✓	✓	□
6. Use available local funds, when necessary, to protect the public services, critical facilities, lives, health, and safety from natural and manmade hazards.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓
7. Strive to improve and expand business, infrastructure, education and housing opportunities in Livingston County in conjunction with planned mitigation efforts.	✓	✓	✓	✓	□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 9-3 Action Items and Recommendations

	Administrative			Mitigation Program												Public Information				
Responsible Agency	1. Plan Adoption	2. Continuation of Hazard Mitigation Planning Committee	3. Plan Maintenance and Monitoring	4. Consideration of Building Codes	5. Continued Compliance with the NFIP	6. Consideration of Safety Requirements for Manufactured Home Communities	7. Drainage System Maintenance	8. Infrastructure Improvements	9. Mitigation for Floodplain Properties and Critical Facilities	10. Grant Funding for Safe Rooms	11. NIMS Compliance	12. Participation in StormReady	13. Improved Threat Recognition	14. Critical Facility Design with All Hazards Protection	15. Include the All Hazards Plan into Other Plans	16. Information for Floodplain Property Owners	17. Educate Property Owners on Safe Rooms	18. Develop Livingston Co. Public Info. Materials for Hazard Mitigation	19. Disseminate Public Information Materials on Hazard Mitigation	20. Property Protection Library – Available Free Resources
	Recommendations																			
	Ch. 4. Preventive Measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Ch. 5. Property Protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Ch. 6. Structural Projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Ch. 7. Emergency Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Ch. 8. Public Information	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Table 9-4 Action Items Assigned to Participation Jurisdictions

Responsible Agency	Administrative			Mitigation Program												Public Information				
	1. Plan Adoption	2. Continuation of Hazard Mitigation Planning Committee	3. Plan Maintenance and Monitoring	4. Consideration of Building Codes	5. Continued Compliance with the NFIP	6. Consideration of Safety Requirements for Manufactured Home Communities	7. Drainage System Maintenance	8. Infrastructure Improvements	9. Mitigation for Floodplain Properties and Critical Facilities	10. Grant Funding for Safe Rooms	11. NIMS Compliance	12. Participation in StormReady	13. Improved Threat Recognition	14. Critical Facility Design with All Hazards Protection	15. Include the All Hazards Plan into Other Plans	16. Information for Floodplain Property Owners	17. Educate Property Owners on Safe Rooms	18. Develop Livingston Co. Public Info. Materials for Hazard Mitigation	19. Disseminate Public Information Materials on Hazard Mitigation	20. Property Protection Library – Available Free Resources
Village of Campus	✓	✓	✓	✓	☐	✓	✓	✓	☐	✓	✓	✓	✓	✓	✓	☐	✓	✓	✓	✓
Village of Chatsworth	✓	✓	✓	✓	☐	✓	✓	✓	☐	✓	✓	✓	✓	✓	✓	☐	✓	✓	✓	✓
Village of Cornell	✓	✓	✓	✓	☐	✓	✓	✓	☐	✓	✓	✓	✓	✓	✓	☐	✓	✓	✓	✓
Village of Cullom	✓	✓	✓	✓	☐	✓	✓	✓	☐	✓	✓	✓	✓	✓	✓	☐	✓	✓	✓	✓
Village of Dwight	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Village of Emington	✓	✓	✓	✓	☐	✓	✓	✓	☐	✓	✓	✓	✓	✓	✓	☐	✓	✓	✓	✓
City of Fairbury	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Village of Flanagan	✓	✓	✓	✓	☐	✓	✓	✓	☐	✓	✓	✓	✓	✓	✓	☐	✓	✓	✓	✓
Village of Forrest	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Village of Long Point	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Village of Odell	✓	✓	✓	✓	☐	✓	✓	✓	☐	✓	✓	✓	✓	✓	✓	☐	✓	✓	✓	✓
City of Pontiac	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Village of Saunemin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Village of Strawn	✓	✓	✓	✓	☐	✓	✓	✓	☐	✓	✓	✓	✓	✓	✓	☐	✓	✓	✓	✓
Reading Township	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Livingston County	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

## Appendix A. Livingston County Mitigation Planning Committee Participation

Livingston County All Hazards Mitigation Plan  
**Hazard Mitigation Committee**  
**Sign-In/Attendance**

Name:	Representing:	Department	Title:
Chuck Schopp	Livingston County	ESDA	
David Winters	Livingston County	Highways	Highway Engineer
MaLinda Hillman	Livingston County	Health Department	
Sondra Hayes	American Red Cross of the Heartland		Director of Emergency Preparedness
Mike McKnight	American Red Cross of the Heartland		Director of Disaster Response
Lori Shafer	Village of Chatsworth		ESDA Director
Galen Schaffer	Village of Chatsworth		Fire Chief
Kevin McNamara	Village of Dwight		Administrator
Daniel Delaney	Village of Emington		President
Annelise Fiedler	Village of Emington		Trustee
Iris Thorne	Village of Odell		Clerk
Robert Karls	City of Pontiac		City Administrator
George McMullen	Reading Township		Trustee
Bob Bradford	Village of Saunemin		Mayor
Steve Schaffer	Village of Saunemin		Trustee
Leroy E. McPherson	City of Fairbury	Administration	City Supervisor
Greg Michaud	JDQ, Inc	Environmental Services	Manager
Stu Parthe	Emington		Citizen

## Appendix B.

### Public Involvement Activities

Below are samples of public information and public involvement activities that were used during the development of the *Livingston County All Hazards Mitigation Plan*, including:

- Meeting Schedule announced
- Frequently asked questions
- Public meeting and public comment announcements
- Public meeting Agenda from October 27, 2010
- Public meeting sign-in sheets

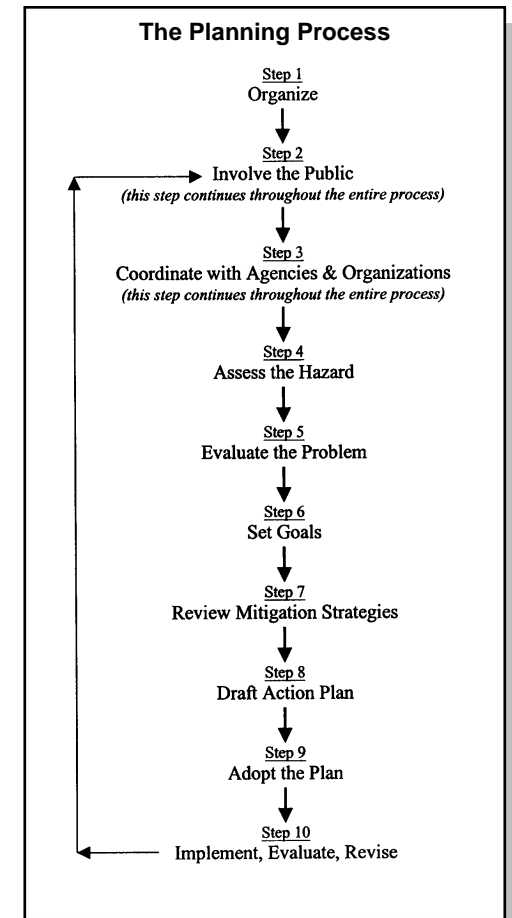


## Livingston County Hazard Mitigation Planning Committee

### Meeting Schedule

Meetings will at 7:00 p.m. in the Pontiac City Council Chambers at 115 W. Howard Street in Pontiac.

Meeting Date	Planning Steps	Major Activity
Wednesday, April 21, 2010	1, 2, 3,4	Organizational meeting, review public involvement and coordination efforts. Identifying & prioritizing hazards.
Wednesday, May 12, 2010	4,5,6	Hazard assessment (what hazards and damage have we experienced) and problem assessment (what can the hazards do to us). Goal setting. Introduction to mitigation activities.
Wednesday, June 16, 2010	6,7	Hazard mitigation activities: Structural projects (reservoirs, channel improvements), property protection activities (retrofitting existing buildings, insurance, etc.), and emergency services (warning, response and recovery efforts).
Wednesday, August 18, 2010	7,8	Hazard mitigation activities: Preventive activities (plans, codes and regulation of new development), natural resource protection (water sources, recreation areas), and public information. Action plan overview.
Wednesday, September 22, 2010	8	Action plan development.
Wednesday, October 27, 2010	8, 9	Public meeting, final plan review, recommendation to the County Board, city councils and village boards.



### Contacts

Chuck Schopp, Livingston County ESDA, 815-844-7741, cschopp@maxwire.net

or

Molly O'Toole, Molly O'Toole & Associates, Ltd., Planning Consultant, 630/889-9774, molly@mollyotoole.com

April 2010

## Livingston County All Hazards Mitigation Plan

### Mitigation Plan Frequently Asked Questions (Mitigation Plan FAQs)

#### 1. What is the *Livingston County Natural Hazard Mitigation Plan*?

The *Livingston County Natural Hazard Mitigation Plan* is a multi-hazard mitigation plan that addresses natural and manmade hazards that may impact Livingston County. It is considered to be a multi-jurisdictional plan.

#### 2. What is hazard mitigation?

Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Examples of hazard mitigation include flood control projects, storm warning systems, and building codes.

#### 3. Why is/was the *Plan* being developed?

The *Plan* is being developed to fulfill the federal mitigation planning requirements of Section 104 of the Disaster Mitigation Act of 2000 and the Stafford Act for funding under the following Federal Emergency Management Agency (FEMA) mitigation programs:

- Pre-Disaster Mitigation Program (PDM)
- Hazard Mitigation Grant Program (HMGP)
- Flood Mitigation Assistance Program (FMA)

#### 4. What will the *Plan* address?

The *Plan* will identify activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage caused by natural and manmade hazards. The *Plan* focuses on the identified major hazards facing Livingston County: severe summer storms, winter storms, tornadoes, extreme heat and cold events, radiological incidents, utility interruptions, transportation incidents and hazardous materials incidents.

#### 5. Who is developing the *Mitigation Plan*?

The *Plan* is being prepared by the Livingston County Hazard Mitigation Planning Committee. The Committee members include representatives of County offices, interested municipalities, agencies, and institutions.

#### 6. The *Plan* is considered is multi-jurisdictional. Is this the same as “countywide”?

No, the *Plan* is not a countywide plan. Each government agency will adopt and implement the *Plan* for its own purposes. The County Board adoption of the *Plan* will be for the unincorporated areas of the County. Each municipality must adopt and implement the *Plan* for their own purposes.

#### 8. What is the status of the *Plan*?

The development of the *Plan* began in April 2010. It is expected that the *Plan* will be sent to FEMA for review in November 2010.

**9. How will we adopt the *Plan*?**

By resolution. A sample resolution has been provided to the Committee members in October or November 2010.

**12. What if we don't adopt the *Plan*?**

Then your community will not be eligible for hazard mitigation grant funds from FEMA programs.

**13. If we don't adopt the *Plan* will our community be eligible for IEMA/FEMA disaster assistance following a disaster declaration for Livingston County?**

Yes. This *Plan* is for the mitigation grant purposes. It is not tied to disaster assistance. Recognize that often mitigation projects come to light following a disaster. It is prudent to have an adopted mitigation plan.

**14. What are the types of mitigation grants available?**

Planning grants and project grants. Examples of mitigation planning grants would be for the study of repetitive flood loss areas, or the evaluation of critical facilities to determine if they are disaster resistant. Examples of mitigation project grants would be for floodplain property acquisitions, or construction of a tornado shelter at a senior care facility. All plans and projects are funded 75 percent by FEMA and 25 percent by the community or agency.

**15. How do we apply for a mitigation grant?**

PDM, HMGP, and FMA grants are applied for through the IEMA. An online "eGrant" application is used. Communities can contact Ron Davis, the State Hazard Mitigation Officer at IEMA, at 217/782-8719 for more information.

**16. What is the FEMA web site for hazard mitigation grants?**

Links to more information about FEMA mitigation grant programs can be found at:  
<http://www.fema.gov/about/divisions/mitigation/mitigation.shtm>

Also, visit IEMA's web site at:  
<http://www.state.il.us/iema/planning/planning.htm>

**17. How can I learn more about the Community Rating System (CRS)?**

Information on the CRS can be found at FEMA's web site:  
<http://www.fema.gov/business/nfip/crs.shtm>

**18. Who should I contact at the County if I have more questions?**

If you have any questions, please feel free to contact Molly O'Toole, the planning consultant at 630/889-9774, or via e-mail at [molly@mollyotoole.com](mailto:molly@mollyotoole.com), or Chuck Schopp of Livingston County ESDA at 815-844-7741, [cschopp@maxwire.net](mailto:cschopp@maxwire.net).

October 2010 – For Immediate Release

**“Public Meeting to Be Held on the Livingston County All Hazards Mitigation Plan”**

The Livingston County Hazard Mitigation Committee has completed the development of the Livingston County All Hazards Mitigation Plan. A public meeting will be held on Wednesday, October 27<sup>th</sup> to review the Plan.

The public is invited to attend this meeting and to provide comments on the Plan. The Plan will identify activities that can be undertaken by both the government and the private sector to reduce the safety hazards, health hazards, and property damage caused by floods, severe summer and winter storms, tornadoes, and other natural hazards.

The public meeting on Wednesday, October 27<sup>th</sup> will begin at 7:00 p.m. and will be held at the Pontiac City Council Chambers, 115 W. Howard Street in Pontiac. The Plan will also be available on the Livingston County website for review and comment. Comments will be collected for the Plan through November 20<sup>th</sup>.

"Hazard mitigation" means doing everything that can be done to reduce the impact of the natural hazards on people and property. It does not necessarily mean controlling floodwaters or stopping tornadoes. These hazards are natural phenomena and, in many cases, mitigation means adjusting what people do in the face of this natural activity.

Livingston County is subject to natural hazards that threaten life and health and have caused extensive property damage in the past. Again, while these hazards are acts of nature, the impacts on residents, public facilities, businesses, and private property can be reduced through hazard mitigation.

The Livingston County All Hazards Mitigation Plan will be considered by the Livingston County Board for adoption, and also for adoption by the Livingston County municipalities and townships that participated on the Hazard Mitigation Committee. After the Plan is adopted, Livingston County and the participating communities will be eligible for hazard mitigation grant funding through the Illinois Emergency Management Agency and the Federal Emergency Management Agency.

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For more information, contact Chuck Schopp of Livingston County Emergency Management at 815-844-7741 or Molly O'Toole, planning consultant, at 630-889-9774.



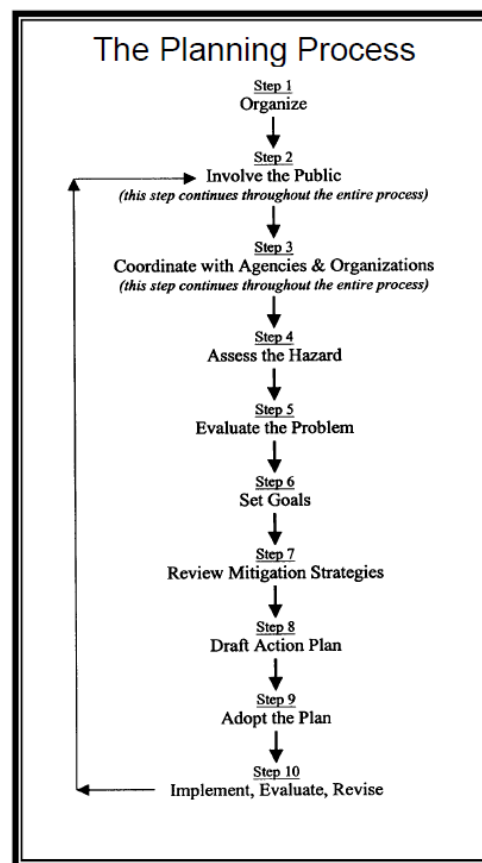
## Livingston County Hazard Mitigation Committee

Wednesday, October 27, 2010

Pontiac City Hall

### Public Meeting Agenda

1. Introductions
2. Plan Overview
3. Action Plan Discussion
4. Public Comment
5. Next Steps
  - Public Review Comments Until November 24, 2010
  - IEMA and FEMA Review & Approval
  - County and Community Adoption
6. Adjourn



Livingston County All Hazards Mitigation Plan Hazard Mitigation Committee Sign-In/Attendance					
Initials	Name:	Representing:	Department	Title:	Ad
<i>CS</i>	Chuck Schopp	Livingston County	ESDA		110 W. Water S
	David Winters	Livingston County	Highways	Highway Engineer	1705 S. Manlov
<i>mb</i>	MaLinda Hillman	Livingston County	Health Department		P.O. Box 650
	Sondra Hayes	American Red Cross of the Heartland		Director of Emergency Prep	One Westport C
<i>WJ</i>	Mike McKnight	American Red Cross of the Heartland		Director of Disaster Respons	One Westport C
	Lori Shafer	Village of Chatsworth		ESDA Director	601 E. Ash Stres
<i>GS</i>	Galen Schaffer	Village of Chatsworth		Fire Chief	508 E. Hickory
<i>KN</i>	Kevin McNamara	Village of Dwight		Administrator	209 S. Prairie A
	Daniel Delaney	Village of Emington		President	203 South Street
	Annelise Fiedler	Village of Emington		Trustee	106 South Street
	Iris Thorne	Village of Odell		Clerk	213 S. Front Stre
	Robert Karls	City of Pontiac		City Administrator	115 W. Howard
<i>bm</i>	George McMullen	Reading Township		Trustee	1834 S. Jacob St
	Bob Bradford	Village of Saunemin		Mayor	43 Main Street
	Steve Schaffer	Village of Saunemin		Trustee	83 E. Main
	Leroy E. McPherson	City of Fairbury	Administration	City Supervisor	201 W Locust St
	Greg Michaud	JDQ, Inc	Environmental Services	Manager	Springfield

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